

2004

PATENT ATTORNEYS

EXAMINATION

PAPER E

Patent Attorney Practice in New Zealand
Including the
Interpretation and Criticism of Patent Specifications

Regulation 158 (1) (e)

Duration: 4 hours (plus 10 minutes for reading)

INSTRUCTIONS TO CANDIDATES

Due to a conflict of interest at another firm, you have been sent the file relating to the patent of Ms X.

Ms X's NZ Patent No. 123456 is attached together with the relevant IPONZ database extract ("A").

Ms X has become concerned about a competing product, the PET BOX™, which she believes infringes her patent. A description of the offending product is also attached ("B").

Before getting advice from her attorneys, Ms X was so incensed by the infringement that she wrote a letter to the manufacturers of PET BOX™. A copy of that letter is attached ("C").

She received the attached reply ("D").

The enclosures referred to in letter D are also attached:

1. US 1,698,955 ("E");
2. US 3,951,107 ("F");
3. Lixit Food Hopper webpage ("G").

Ms X seeks your urgent advice. A meeting is scheduled in four hours. Please prepare a memorandum of advice to be given to Ms X at the meeting, covering (with reasoning):

1. The scope of Ms X's patent protection, and whether PET BOX™ is an infringement of NZ Patent No. 123456;
(40 marks)

2. Whether NZ Patent No. 123456 is likely to be held invalid;
(48 marks)

3. Whether Ms X can do anything to strengthen her position, including any other causes of action which may be available to her;
(10 marks)

4. What actions the proprietors of PET BOX™ may take against Ms X, and the likelihood of success.
(2 marks)

If there is any other information that you would seek to assist you in giving advice, please describe what it is, and how you would set about getting it.

ATTACHMENTS

- A. Complete specification of New Zealand Patent No. 123456 (6 pages of description + 1 page of claims + 2 pages of drawings comprising Figs 1-3) and IPONZ database extract for the patent.
- B. Description (1 page) and drawings (Figs 1 and 2) of PET BOX™.
- C. Letter from Ms X to Pet Box Makers Limited.
- D. Letter from Pet Box Makers Limited to Ms X.
- E. Specification of US 1,698,955 available from the IPONZ Library since 1 June 1930.
- F. US Patent No. 3,951,107 available from the IPONZ Library since 1 December 1976.
- G. Webpage describing Lixit Food Hopper food dispenser for small animals.

1

“A”

123456

Patents Form # 5

NEW ZEALAND

Patents Act 1953

COMPLETE SPECIFICATION

AFTER PROVISIONAL NO 123456

DATED 12 May 1988

TITLE - PET FOOD DISPENSER

We, SERIAL CAT KILLER LIMITED, a New Zealand company of 99 Random Street, Smalltown, New Zealand, do hereby declare the invention for which I/we pray that a patent may be granted to us and the method by which it is to be performed, to be particularly described in and by the following statement:

The present invention relates to food dispensers, and has particular application to dispensers for granular or pelletised food for animals such as cats or other household pets.

Various forms of animal food dispenser have been proposed in the past, to allow regulated or unregulated feeding of animals with little or no human supervision over a period of time. Such apparatus has however suffered from a number of problems and disadvantages which can render them impractical for the purpose.

Apparatus such as that shown in US Patent No. 1,234,567 (1976) Smith, or US Patent No. 2,345,678 (1977) Jones comprise simple "hopper" mechanisms by which a feed area is kept constantly supplied from a storage bin. Agitator means is provided to help avoid clogging of the passage from the storage area to the feed area. A problem found with this type of mechanism is that the amount of food available to the animal at any one feeding is substantially uncontrolled, except by the total capacity of the storage area, and consequently it is found that animals are driven by natural greed and gluttony to consume much more than they actually should. Furthermore, because the feed area is constantly replenished, food is often wasted and scattered about by the animal, spoiled by moisture or long exposure to the open air in the feed area, and consumed by rodents or insects attracted to it.

Other apparatus provide mechanisms which are intended to overcome such problems, as shown in US Patent No. 4,421,059 (1983) Cousino or US Patent No. 4,733,634 (1988) Hooser. Such apparatus is however relatively complicated and therefore expensive, including electronic timing or metering means and the like, and may be prone to jamming or damage by the infortuitous scattering of food by the animal. Furthermore there is a possibility of injury to the animal by the opening and closing mechanism, a problem specifically referred to in a further specification of the type, GB 2,183,984A (1986) Kirk. The volume of food dispensed is predetermined, and may be unsuitable for the animal concerned either because of ignorance on the part of the animal's owner, or because of inflexibility in the dispensing mechanism. Because a timer is used to make food available only at specific times, an animal may miss out on meals by not being in attendance at the appropriate time, or the food may have become stale or soggy by the time the animal gets there. An attempt to overcome this problem is shown in the Hooser apparatus, which provides a pre-recorded summons and playback apparatus, but this clearly further increases the complexity and expense of the apparatus. A further problem with such apparatus is that if a fast or large animal reaches the device at the appropriate time before the intended consumer and

consumes the meal provided, the intended consumer will get nothing and go hungry.

It is an object of the present invention to go at least partway towards providing solutions to the above problems, or at least to provide the public with a useful choice.

In one aspect the present invention provides animal food dispensing apparatus, including an enclosure having therein a food reservoir, an aperture in said enclosure, a feeding plate positioned outside said enclosure wherein said aperture opens onto said feeding plate, and an obstruction between said reservoir and said aperture by which the passage of food from said reservoir to said aperture can be restricted, and wherein an animal can consume food from said apparatus by moving said obstruction to dispense food through said aperture onto said feeding plate, and eating said food on said feeding plate.

Preferably there is a pathway between said reservoir and said aperture, and movement of said obstruction dispenses food onto said pathway, wherein to be able to eat said food the animal moves said food along said pathway and through said aperture.

Preferably said obstruction is distanced from said aperture in said enclosure.

Preferably said pathway is sloped downwardly towards said aperture from the vicinity of said obstruction, at an angle to the horizontal of less than the normal angle of repose of granular or pelletised food, so that said food will not in normal use gravitate to said aperture without assistance, but will when moved be biased towards said aperture by the slope of said surface.

Preferably said reservoir is provided with a floor, comprising a surface adjoining said pathway and said obstruction includes a pivotable flap which provides a wall of said reservoir, a lower edge of said pivotable flap being disposed on or near said floor in normal use providing a constricted outlet gap from said reservoir, whereby in use movement of said flap can open an outlet gap between said lower edge and said floor, and also agitate the contents of said reservoir.

Preferably the minimum size of the gap is adjustable.

Preferably the pivotable flap is biased towards a rest position, so that in normal use it will return to said position after being moved.

Preferably the amount of food allowed passage onto said surface by an animal clearing said obstruction is limited in normal use to a small portion of the amount normally required by the animal at a meal, and passage of further food onto said surface is obstructed by any food already on said surface.

In another aspect the invention provides a method for feeding an animal including the steps of providing said animal with access to a reservoir of food, and limiting said access with a recurring obstruction, arranged so that the quantity of food available to said animal through said access is proportional to the perseverance of said animal in clearing said obstruction.

These and other aspects of the present invention, which should be considered in all its novel aspects, will be made apparent in the following description of preferred embodiments of the present invention, which are given by way of example only, with reference to the accompanying drawings in which:

Figure 1: gives a sectional side view of a preferred dispenser of the present invention.

Figure 2: gives a perspective view of the dispenser of Figure 1.

Figure 3: gives a perspective view of a second embodiment of the present invention.

As shown in Figure 1 and Figure 2 the apparatus in its preferred form comprises a food dispenser for cats, for use with pelletised solid cat foods.

The apparatus as shown is arranged to require operation of an outlet mechanism by the animal to release a small quantity of food, which must in normal use then be eaten or removed before more food can be released. Operation of the apparatus is not normally difficult for the animal, but requires sufficient effort and perseverance from the animal that it will not generally persist with the operation when it is not hungry. In this way, the amount of food provided for an animal to eat is governed by its own appetite and perseverance, rather than by mechanical means, or human intervention. Furthermore, the food remains protected in the storage reservoir until the animal wants it.

In Figure 1 there is shown a preferred dispenser 10 comprising a box-like container which may be formed of metal, plastics, card or other suitable material. The container comprises a pair of spaced parallel narrow vertical walls 14a and 14b, and a pair of spaced parallel wide vertical walls 16a and 16b, the walls 14 being substantially perpendicular to the walls 16, a flat horizontal floor 18 and removable lid 19 which closes the upper end of the container in normal use. The floor 18 is provided with a sloped ramp 32.

Inside the container, a movable flap 20 is provided, extending down from a pivot point 22 near the top of wall 14a at a steep angle, and extending across substantially the whole width of the container to form a partition. At its lower edge 24 the flap 20 is spaced a short distance above the ramp 32 in normal use, and is also spaced apart from the wall 14b.

The flap 20, the walls 16 and the wall 14b define a hopper 26 within the container, in which food pellets 28 can be held, which will gravitate onto the ramp 32 at the hopper base 30.

The slope of the ramp 32 is preferably less than the angle of repose of the food pellets 28, so that pellets 28 on the ramp 32 at the base 30 of the hopper will not generally gravitate along the ramp 32 or through the gap 34 under the lower edge 24 of the flap 20.

An outlet aperture 36 is provided at the base of the ramp 32, in the wall 14a. This aperture may be of a range of sizes, but in the model illustrated in Figure 1 and Figure 2, intended for dispensing food for cats, the aperture should be of a size sufficient to allow a cat to reach the flap 20 with its paw, but insufficient for a cat to enter the container with its head or body. By reaching the lower edge 24 of the flap 20 with its paw, a cat can agitate the pellets 28 in the hopper and cause them to spill out through the gap 34 onto the lower part of the ramp 32. The pellets can then be flicked or dragged down the ramp 32 and out the outlet aperture 36, where they can be consumed. Because the slope of the ramp 32 is too slight to allow pellets to slide down it without assistance, the presence of pellets in or around the gap 34 will in normal use prevent further pellets from spilling out by effectively blocking the gap 34.

To facilitate use with food pellets of different sizes, the minimum size of the gap 34 is preferably adjustable, so that the degree of obstruction is not too great or too little for proper functioning of the apparatus. This is preferably achieved by

raising or lowering the flap 20 and supporting it with a pin 38 inserted through a selected one of several vertically spaced pairs of holes or detents 40 in the walls 16.

It will be appreciated that a variety of modifications may be made in the above examples within the general scope of the present invention. In particular, a version intended for dogs rather than cats, as shown in Figure 3, will have a larger outlet aperture 36', and the base of the flap 20 may be positioned relatively closer to the aperture 36' than in apparatus as illustrated in Figures 1 and 2. Such alterations are found desirable, because dogs tend to fossick with their muzzles, rather than with their paws as cats do, and consequently the arrangement of parts of the apparatus must be altered to permit access of the type required. Other changes might also be made to take into account the physiological differences between cats and dogs or other animals - for example, the apparatus 10 might be made in a heavier or more stable form, or be adapted for fixture to a substrate, to prevent large dogs from knocking it over.

Further modifications might also be made. A tray 42 is preferably provided at the mouth of the aperture 36, and this could take any of a variety of forms. Apparatus for providing water might be associated with the dispenser 10, and the overall shape of the dispenser could be altered considerably without interference with the functioning of the apparatus.

Other changes and modifications might be made within the general scope of the present invention, as characterised by the following claims:

What I Claim Is:

1. Animal food dispensing apparatus, including an enclosure having therein a food reservoir, an aperture in said enclosure, a feeding plate positioned outside said enclosure wherein said aperture opens onto said feeding plate, and an obstruction between said reservoir and said aperture by which the passage of food from said reservoir to said aperture can be restricted, and wherein an animal can consume food from said apparatus by moving said obstruction to dispense food through said aperture onto said feeding plate, and eating said food on said feeding plate.
2. Animal food dispensing apparatus as claimed in claim 1, wherein there is a pathway between said reservoir and said aperture, and movement of said obstruction dispenses food onto said pathway, wherein to be able to eat said food the animal moves said food along said pathway and through said aperture
3. Animal food dispensing apparatus as claimed in claim 1 or claim 2 wherein said obstruction is distanced from said aperture.
4. Animal food dispensing apparatus as claimed in any one of claims 1 to 3, wherein said pathway is sloped downwardly towards said aperture from the vicinity of said obstruction, at an angle to the horizontal of less than the angle of repose of granular or pelletised animal food.
5. Dispensing apparatus as claimed in any one of claims 1 to 4, wherein said reservoir is provided with a floor, comprising a surface adjoining said pathway, and said obstruction includes a pivotable flap disposed in a rest position near said floor, providing a constricted outlet gap between said flap and said floor.
6. Dispensing apparatus as claimed in claim 5, wherein said flap provides a wall of said reservoir.
7. Dispensing apparatus as claimed in claim 5 or claim 6, wherein the rest position of said flap is adjustable.
8. Dispensing apparatus as claimed in any one of claims 5 to 7, wherein said flap is biased towards said rest position, so that in use it will tend to return towards said rest position after being moved.
9. Dispensing apparatus substantially as herein described with reference to any one of the accompanying drawings.

SMITH & CO. Attorneys for Applicant

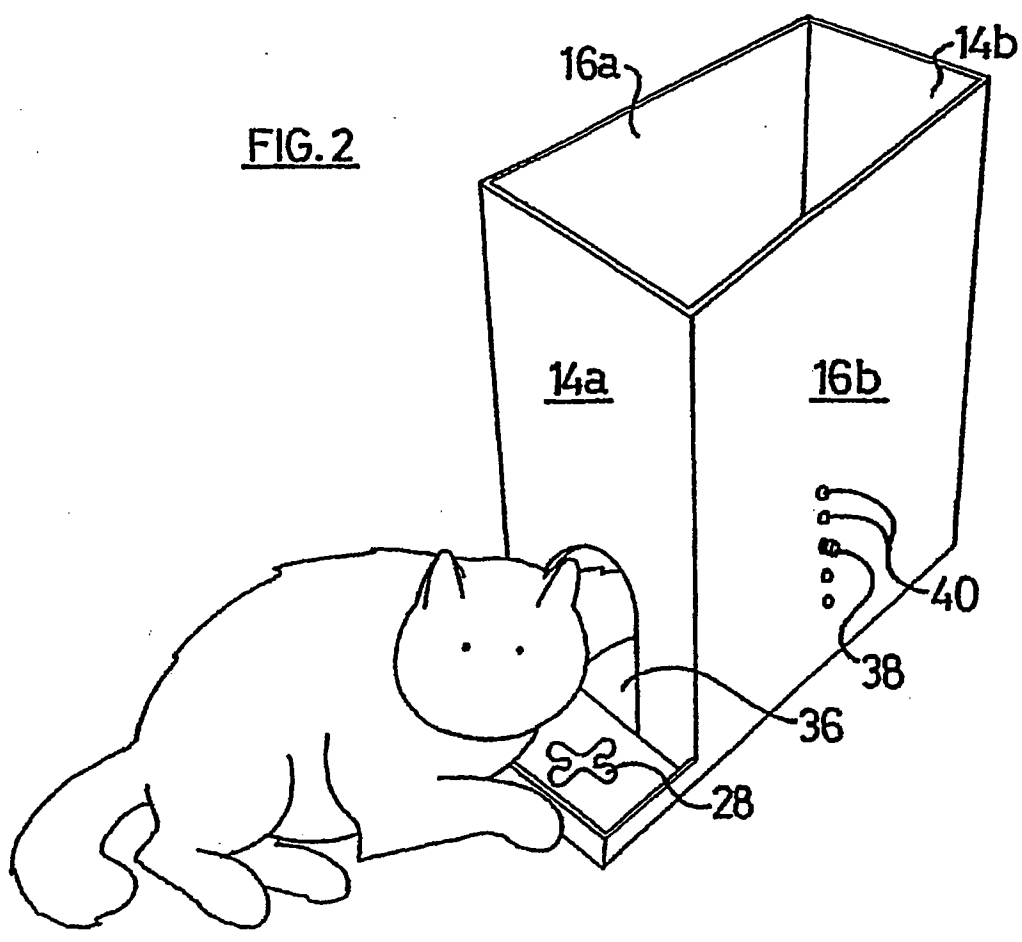
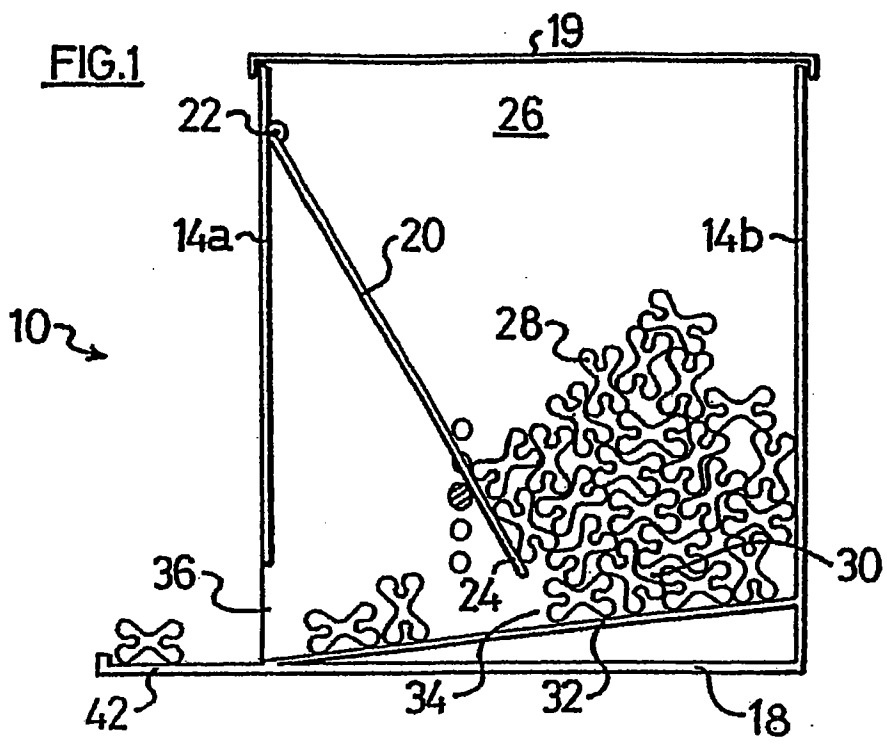
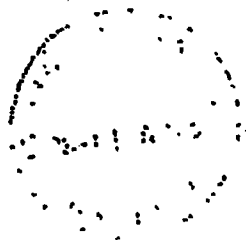
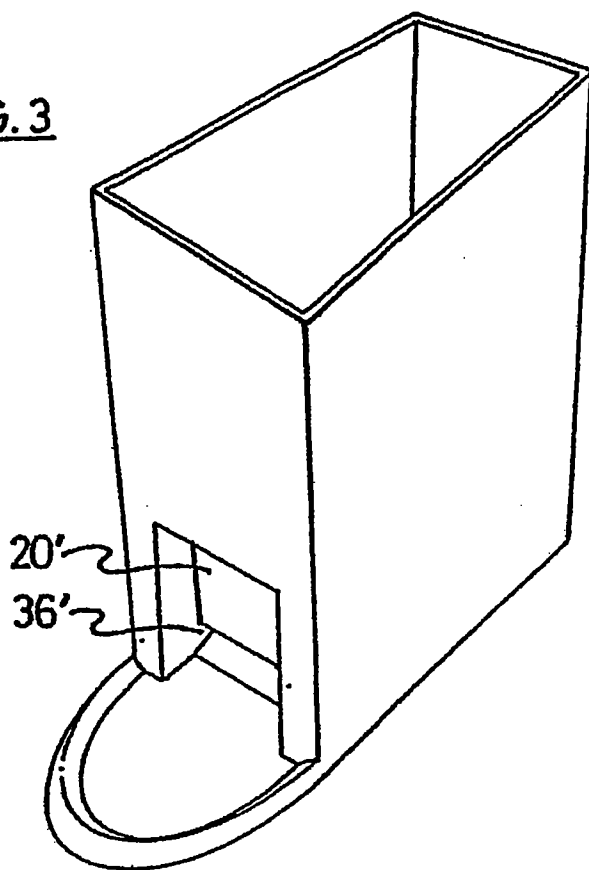


FIG. 3



Patent Details

Patent Number ⁽¹¹⁾ 123456 **Current Status** Granted and Sealed

International Application Number

WO Publication Number

Patent Type Patent Non-Convention Complete

Patent Title ⁽⁵⁴⁾ PET FOOD DISPENSER

Filed ⁽²²⁾ 20-APR-1989

Provisional 12-MAY-1988

Class ⁽⁵¹⁾

Classification **Schedule and Edition**

IPC|A01K5/00 IPC1

Documents

Abstract/Abridgement [Document](#) .9 Kb

Provisional Specification [Document](#) 235.9 Kb [View as PDF](#)

Complete Specification [Document](#) 381.4 Kb [View as PDF](#)

Applicant / Patentee: ⁽⁷¹⁾ SERIAL CAT KILLER LIMITED

Contact : ⁽⁷⁴⁾ SMITH & CO.

Service Address : As above

Action	Completed	Due	Journal	Published
Renew	19-APR-2002	20-APR-2002	1475	31-MAY-2002
Renewal Notice	23-JAN-2002	23-JAN-2002		
Renew	25-MAR-1999	20-APR-1999		
Renew	12-APR-1996	20-APR-1996		
Renew	22-FEB-1993	20-APR-1993		
Registered	29-JAN-1992	24-FEB-1997	1451	26-MAY-2000
Application Accepted	26-AUG-1991	26-AUG-1991	1348	25-SEP-1991
Filed	12-MAY-1988	12-MAY-1988		

Related Patents

No Related Patents found

Objections / Hearings

There are no current objections or hearings present

Renewal Interest

SMITH & CO

Applicant / Patentee & Licensee History

No applicants nor licensees on record or public access is restricted

Inventors (72)

Xavette X

Your Selection Criteria

IPOL Database Search

Collection: Public**Schedule:** IPC**Patent Number:** 224590

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Delivered: 23rd April 2004 15:20:47

“B”

Introducing ... THE PET BOX!™

No more need for sticky pet food dishes. PET BOX™ is a package and a dispenser in one. As a packaging container, it protects and stores its contents and serves as point of sale packaging. As a dispensing container, it serves as an automatic pet feeder.

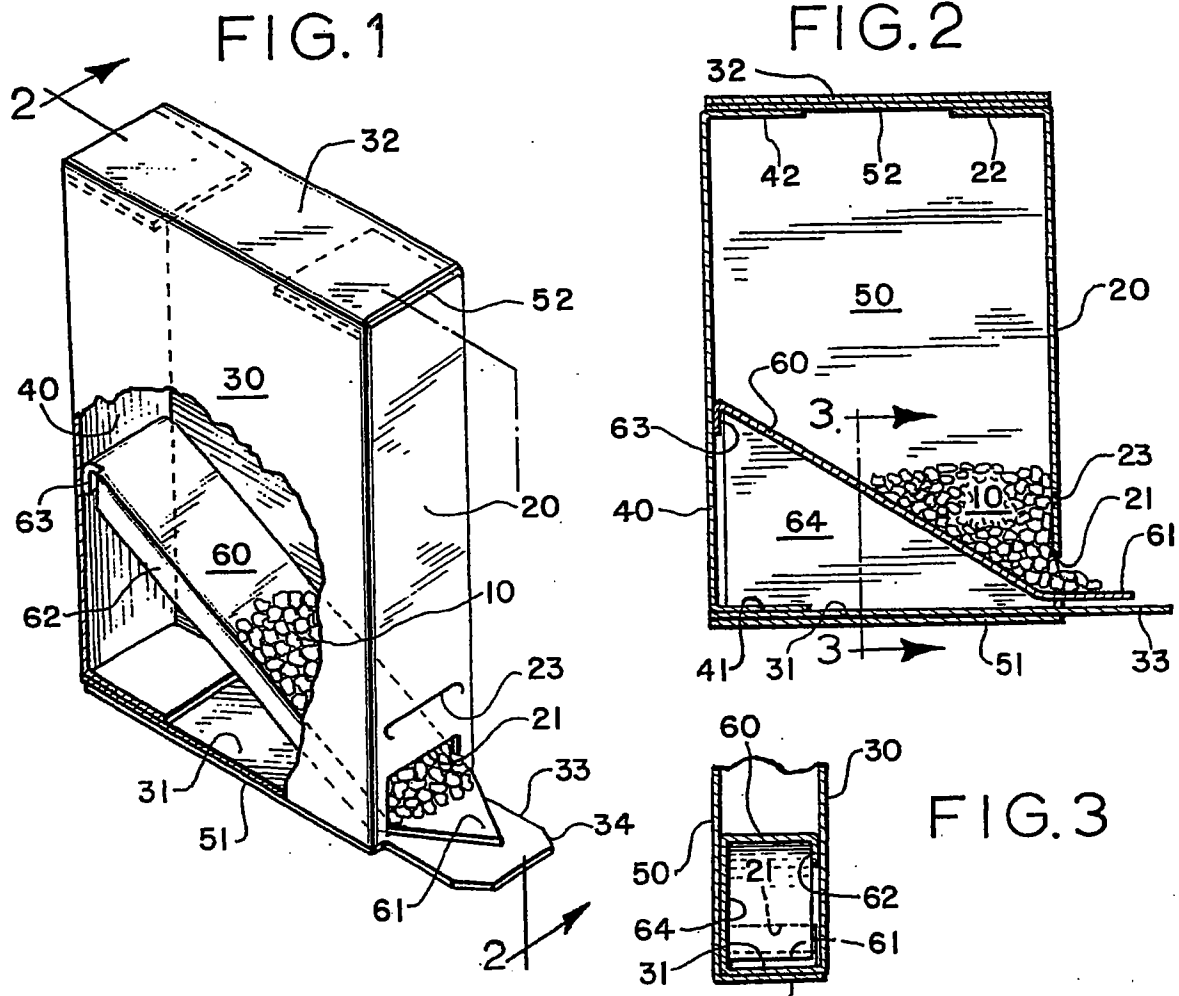
PET BOX™ is an inexpensive disposable container which is easily stacked and stored. It is constructed from a single piece of sheet material to form a container having an internal ramp partition. The ramp directs the food by force of gravity toward and through a dispensing opening. The opening is arranged to control the free flow of the food material. The rate at which the material is dispensed is controlled by a part of the ramp which when moved by the pet assists the flow of food through the opening.

Detailed specifications – see drawings.

After purchase, in order to operate the container as an automatic dispenser, open sealing panel 33 exposing opening 21 and triangular tab 61. With the container in this position the animal being fed regulates the flow of food out of the container by manipulating triangular tab 61.

When the animal manipulates tab 61, partition 60 and the lowermost pieces of food 10 are moved or vibrated causing increased quantities of food 10 to flow through the hole 21.

Note that the configuration and dimensions of the hole 21 are adapted to permit the granular foodstuff 10 to pass through hole 21 while impeding its free flow. The specific dimensions of the opening 21 will vary with the coarseness of the food being dispensed.



PET BOX

“C”

99 Random Street
Smalltown
NEW ZEALAND

28 June 2004

Pet Box Makers Limited
Unit 1
Sleazy Industrial Park
AUCKLAND

You rotten scumbags! I thought I could trust you! Now I find that instead of selling the food dispensers which I sent to you, you have put a cheap rip-off on the market.

Well you should have checked the fine print on my brochures because I have a patent. I'm off to see my lawyers tomorrow and they are going to sue you and all your customers for every penny you've all got.

See you in court!

Ms X
SERIAL CAT KILLER LIMITED

cc: The Editor, New Zealand Herald
The Editor, Dominion Post
The Editor, National Business Review
The Editor, Consumer Magazine

“D”

Pet Box Makers Limited
Unit 1
Sleazy Industrial Park
AUCKLAND

29 June 2004

99 Random Street
Smalltown
NEW ZEALAND

In response to your intemperate letter of 28 June 2004, we draw your attention to the following US patents:

1. US 1,698,955 published 1 June 1930;
2. US 3,951,107 published 1 December 1976.

Our client also informs us that the Lixit Food Hopper Food Dispenser has been around for at least 20 years.

We suggest you get some proper legal advice on your patent. We have.

Yours faithfully

PET BOX MAKERS LIMITED

Patented Jan. 15, 1929.

1,698,955

UNITED STATES PATENT OFFICE.

ANTHONY E. LUTFRING, OF MILWAUKEE, WISCONSIN.

DISPENSING HUMIDOR.

Application filed May 18, 1925. Serial No. 31,087.

The invention relates to dispensing humidors, more particularly for use with cigarettes.

An object of the invention is to provide a cigarette humidor of simple and inexpensive construction including means for dispensing cigarettes one by one as required without materially affecting the humidifying function.

Another object of the invention is to provide a cigarette container with an inclined yielding plate forming the bottom of a cigarette storage space and extending through an opening in a wall of the container adjacent its lower end where it serves to normally close the opening but is movable to expose the opening for permitting the successive removal of cigarettes from the container.

A further object of the invention is to provide means for adjusting the inclined plate to insure the proper feeding of cigarettes from the container.

A further object of the invention is to perfect details of construction generally.

The invention further consists of the several features hereinafter set forth and more particularly defined by the annexed claims.

In the accompanying drawings, Fig. 1 is a side elevation of a dispensing humidor embodying the invention, parts being shown in longitudinal section; and

Fig. 2 is a front end view thereof.

In these drawings, 10 indicates a rectangular casing of a width slightly greater than the length of a cigarette, and 11 indicates a slide cover removably mounted thereon and provided with a knob 12 which will serve as a handle to lift the casing and by which the cover may be withdrawn from the casing. The casing may be conveniently constructed of wood, as shown in the drawings, but if desired, may be constructed of cast metal or sheet metal stampings.

A shallow recess 13 is formed in the bottom of the cover 11 to receive a flat pad 14 of absorbent material held in place by a spring ring 15. The absorbent material is moistened after removing the cover from the casing and when the cover is replaced the moistened pad serves to keep the air within the casing in a humid condition.

The front wall 16 of the casing is provided adjacent its lower end with a horizontally-extending opening or slot 17, the upper edge of which is defined by a narrow wedge-shaped portion 18 having an inclined inner

surface 19. An inclined spring-metal plate 20 has its lower end extending through the opening 17 and is provided with a hooked opposite end 21 adapted to engage about the upper edge of a mounting plate 22, which extends diagonally between the front and rear walls of the casing with its lower end at the corner of the front wall 16 and the bottom 23. The mounting plate 22 is held in this position against movement by the engagement of the cover 11 with its upper end, thus making unnecessary the use of special fastening means for the plate, although fastening members may be employed, if desired. The spring plate 20 diverges from the plate 22 near its upper end and the tension of the plate effects its engagement with the wedge-shaped portion 18 to thereby close the opening 17 with respect to the space in the casing above the plate.

The spring-plate 20 forms a yielding bottom wall of a humidifying chamber 24 adapted to receive therein a number of cigarettes 25 extending transversely of the casing, the plate being smooth and polished to permit the cigarettes to slide easily thereon. The front exposed end of the spring-plate 20 is provided with an upwardly extending shoulder portion 26 which has a ledge 27 projecting therefrom to form a fingerhold. The spring-plate 20 is provided adjacent its upper end with a bendable transversely extending ridge 28 spaced from the supporting plate 21. By manipulating or bending the ridge with the fingers it is possible to adjust the effective length of the spring plate 20 and thus adjust the distance between the shoulder portion 26 and the front wall of the casing.

By depressing the front end of the spring-plate 20, the opening 17 will be exposed to the cigarettes above the plate and the lowermost cigarette will be urged by gravity through the opening and against the shoulder portion 26. By then releasing the spring-plate it moves upwardly to again close the opening leaving one cigarette exposed and forcing the others upwardly within the casing. The exposed cigarette may then be readily removed as the shoulder portion 26 and ledge 27 are made somewhat shorter than the width of the opening 17, as seen in Fig. 2. The second lowermost cigarette is prevented from leaving the casing as it is forced upwardly along the inclined surface 19 when the spring-plate returned to its upper position. The distance between the shoulder 26 and the front wall 16 of

the casing is so adjusted by means of the ridge 28 that there is no tendency to pinch the cigarette following the one exposed. The spring-plate 20 fits closely within the casing so that a humid atmosphere may be maintained about the cigarettes by the moistened pad 14.

The removability of the mounting plate 22 together with the spring plate 20 renders the space below the mounting plate available to receive several unopened packages of cigarettes.

The invention provides a humidor of simple and inexpensive construction by which cigarettes may be kept in proper condition and dispensed one by one as required, thus avoiding unnecessary handling. While the dispensing device of the invention is more particularly intended for cigarettes, it will be obvious that the device may be employed to dispense other articles of use in a similar manner.

What I claim as new and desire to secure by Letters Patent is:

1. In a cigarette container, the combination of a rectangular casing, an inclined plate disposed within said casing and extending towards opposite corners, there being an opening in one end of said casing above the lower end of said inclined plate, and an inclined spring plate disposed within said casing and carried on and above said inclined plate to form the bottom of a cigarette-receiving chamber, said spring plate having a lower free end extending through the opening in said casing and provided with a stop spaced outwardly from the opening to receive a single cigarette, said free end of the spring plate being urged upwardly to normally close said opening with respect to said chamber and being movable downwardly to permit the gravity discharge of a cigarette through said opening and against said stop.

2. In a cigarette container, the combination of a casing having an opening in one side wall presenting upper and lower edges, a resiliently mounted inclined bottom plate disposed within said chamber for supporting cigarettes thereon and having a lower free end extending through said opening and carrying a relatively fixed stop spaced outwardly from said opening a distance sufficient to accommodate a single cigarette, said plate being normally urged upwardly against the upper edge of said opening and being movable downwardly to predetermined position against the lower edge of said opening to permit the gravity discharge of a single cigarette through said opening and against said stop, and said chamber-forming casing in normal service being imperforate except for said normally closed opening to permit the humidifying of cigarettes within said chamber.

3. In a cigarette container, the combination of a casing having an opening therein, an inclined spring plate disposed within said

casing to form the bottom of a chamber adapted to receive cigarettes therein, and means for mounting the upper end of said spring plate within the casing, said spring plate having a lower free end extending through said opening and provided with a relatively fixed upwardly projecting part forming a stop, spaced from the apertured wall of the casing slightly more than the diameter of a cigarette, and said free end being urged upwardly to normally close said opening from said chamber and being movable downwardly to permit the gravity discharge of a cigarette through said opening and against said stop.

4. In a cigarette container, the combination of a casing having an opening therein, and an inclined spring plate carried within said casing to form the bottom of a chamber adapted to receive cigarettes therein and having a lower free end extending through said opening and provided with a shoulder spaced downwardly from said casing, said free end being urged upwardly to normally close said opening from said chamber and being movable downwardly to permit the gravity discharge of a cigarette from said opening and against said shoulder, and said plate having a transverse bendable ridge at its upper portion for adjusting the effective length of said plate to vary the distance between said shoulder and said casing.

5. In a cigarette container, the combination of a casing having an opening therein, a cover for said casing, an inclined mounting plate disposed within said casing and held against movement by said cover, and an inclined spring plate secured to the upper end of said mounting plate and extending forwardly and downwardly to form the bottom of a chamber adapted to receive cigarettes therein, said plate having a lower shouldered free end extending through said opening and urged upwardly to normally close said opening from said chamber and being movable downwardly to permit the gravity discharge of a cigarette from said chamber through said opening and against said shouldered end.

6. In a cigarette container, the combination of a casing having an opening therein, a cover for said casing, an inclined mounting plate extending to opposite corners within said casing and held therein by said cover, and an inclined spring plate having a hooked upper end engaging the upper edge of said mounting plate and having a yielding portion forming the bottom of a chamber adapted to receive cigarettes therein, said plate having a shouldered lower end extending through said opening and urged upwardly to normally close said opening from said chamber and movable downwardly to permit the gravity discharge of a cigarette through said opening and against said shouldered end.

7. In a cigarette container, the combina-

tion of a casing adapted to receive cigarettes therein and having a front wall provided with an opening adjacent its lower end, said front wall having a wedge-shaped portion 5 presenting a narrow edge defining the upper boundary of said opening, an inclined yielding plate secured within said casing to form the bottom of the cigarette chamber and extending downwardly through said opening 10 to normally bear against the upper edge of said opening, and a stop fixed on said plate and spaced from said front wall a predetermined distance for limiting the gravity discharge of cigarettes from said casing to one 15 at the time when said plate is depressed to expose said opening, the following unexposed cigarette being forced upwardly within the casing along the wall of said wedge-shaped portion when said yielding plate returns to close said opening.

8. In a dispensing container, the combina-

tion of a casing having a front wall provided with an opening, an inclined spring plate disposed within said casing to form the bottom 25 of a chamber adapted to receive cylindrical objects therein, and means for fixing the upper end of said inclined plate within said casing, the lower free end of said plate projecting outwardly through said opening and having an integral upstanding flange spaced 30 outwardly from said opening a predetermined distance to form a stop limiting the discharge of said objects to one at the time, said lower free end portion of the plate being 35 urged upwardly to normally close said opening from said chamber and movable downwardly to permit the gravity discharge of a cylindrical object through said opening and against said integral stop flange on said plate. In testimony whereof I affix my signature.

ANTHONY E. LUTFRING.

Jan. 15, 1929.

1,698,955

A. E. LUTFRING
DISPENSING HUMIDOR

Filed May 18, 1925

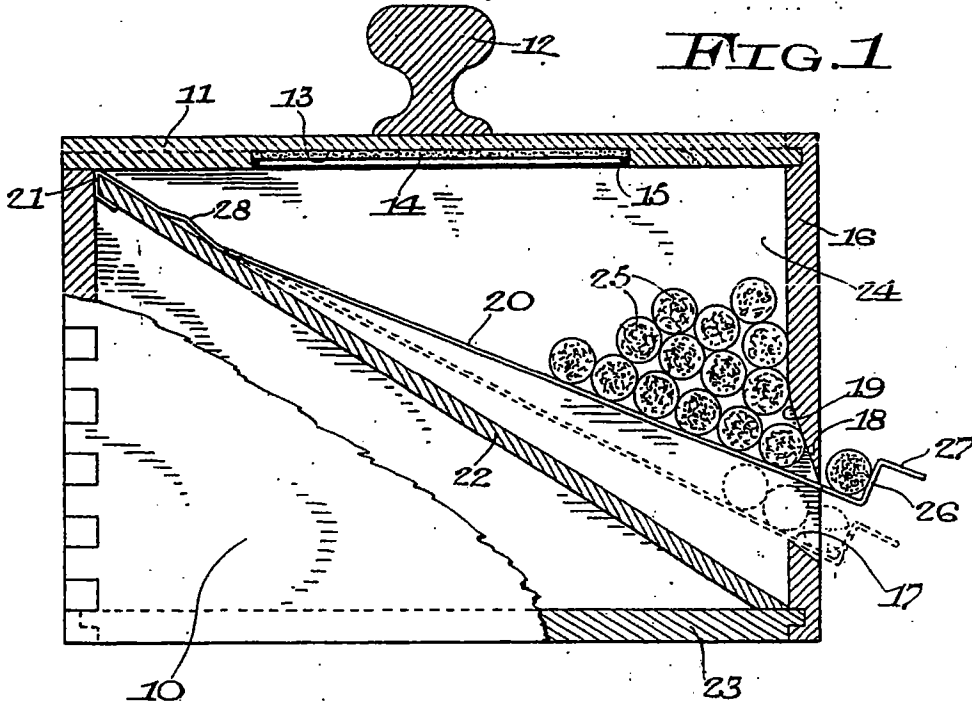


FIG. 1

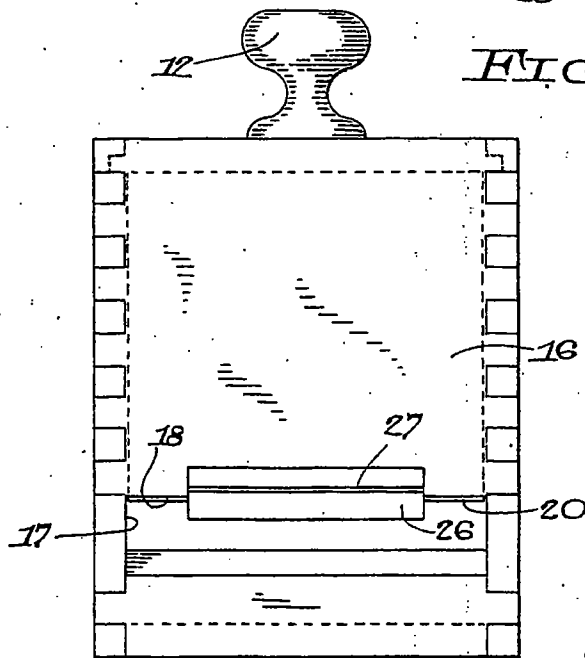


FIG. 2

WITNESSES

M. E. Downey
C. A. Neal

INVENTOR

By Anthony E. Lutfring
R. S. Caldwell
ATTORNEY

[54] ANIMAL FEEDER

[76] Inventor: Harry D. Doty, R No. 2 Box 174,
Harrison, Ohio 45030

[22] Filed: Dec. 12, 1974

[21] Appl. No.: 532,196

[52] U.S. Cl. 119/52 R; 119/53.5

[51] Int. Cl.² A01K 5/00

[58] Field of Search 119/52 R, 52 A, 53.5,
119/54, 53

[56] References Cited

UNITED STATES PATENTS

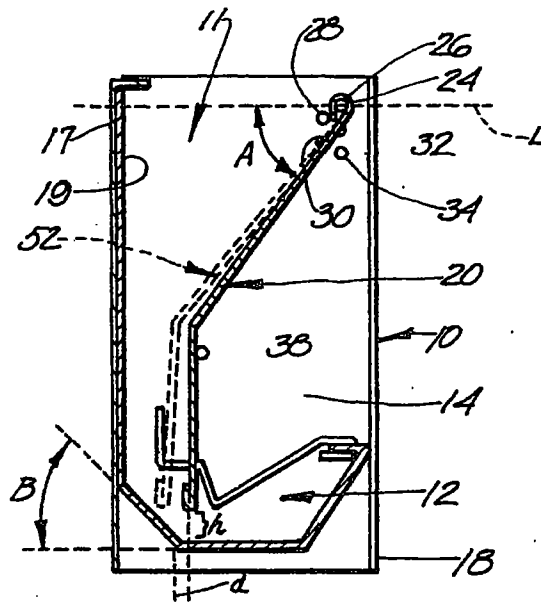
1,239,116	9/1917	Liquist	119/54
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1,926,641	9/1933	White	119/53.5

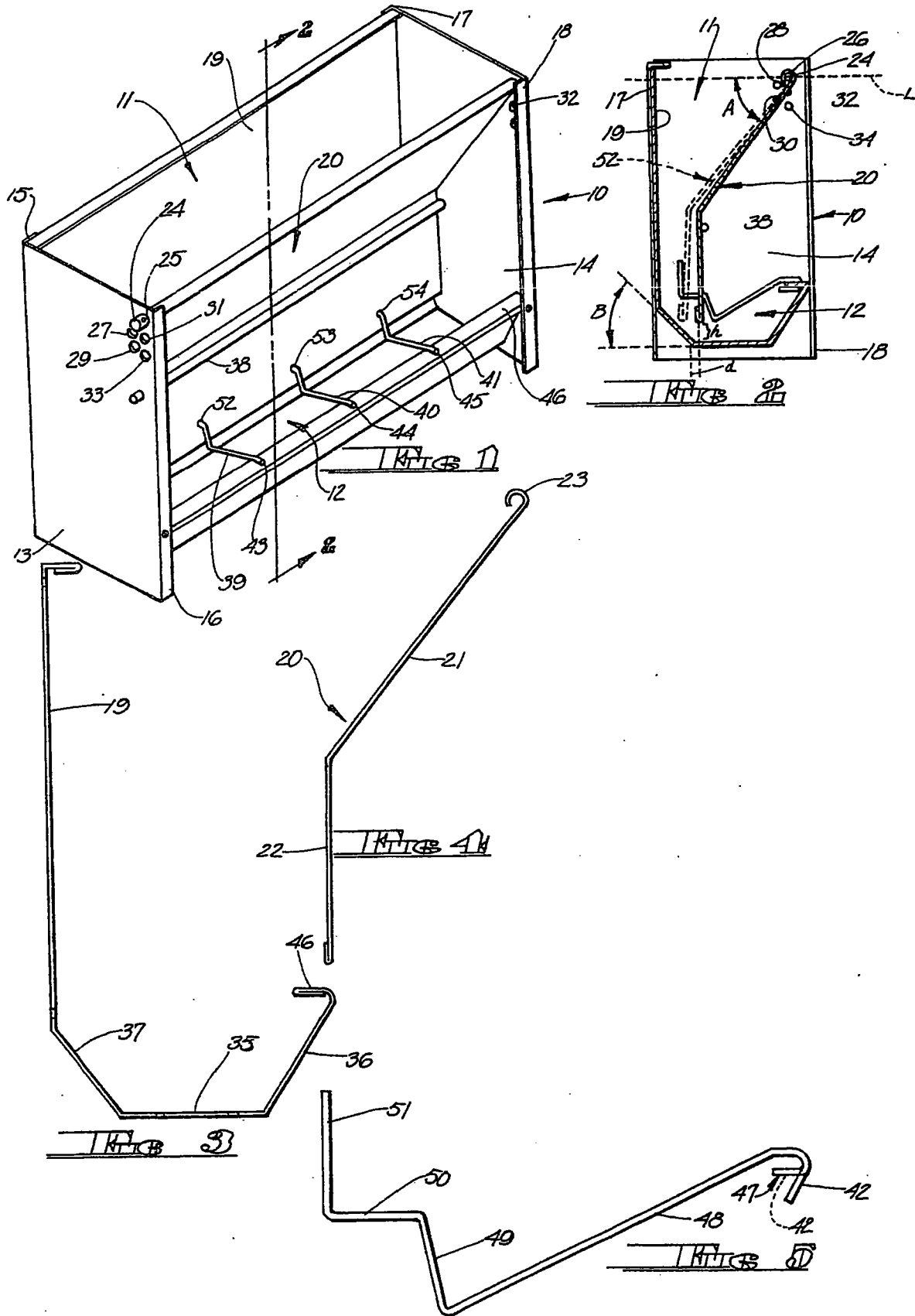
Primary Examiner—Louis G. Mancene
Assistant Examiner—J. N. Eskovitz
Attorney, Agent, or Firm—Melville, Strasser Foster &
Hoffman

[57] ABSTRACT

An animal feeding device for delivering feed to animals and particularly for delivering feed to pigs and the like. The feeder includes an open lid hopper having a swingable front partition, operable by an animal, the upper section of which is downwardly disposed from the horizontal by at least the angle of repose of the feed. The lower section of the partition, with no external forces applied thereto, is maintained in parallel spaced relationship with respect to a vertical rear wall. The hopper communicates with a feed trough having a rear portion upwardly disposed from its substantially horizontal base portion by at least the angle of repose of the feed. The rear portion of the trough also serves as a deflecting device for feed passing from the hopper into the trough. Also included are a plurality of low profile divider bars having a loose fit extension into the hopper for agitating the feed. The low profile divider bars also serve to partition the trough into sections and to prevent both feed contamination and injury to the animal utilizing the feeder.

12 Claims, 5 Drawing Figures





ANIMAL FEEDER

BACKGROUND OF THE INVENTION

The invention relates to an animal feeding device, and more particularly to such a device for delivering feed to pigs and the like in controlled amounts.

In order to economically raise livestock, especially for the market, it is highly desirable to provide the animals with a continuous supply of fresh feed. Prior art feeder devices directed toward achieving this result generally include an open lid hopper for receiving a supply of feed and a feeding-trough communicating with the hopper, the feed passing from the hopper to the trough for consumption by the animals. To insure a free flow of the feed from the hopper to the trough the prior art discloses numerous hopper-trough configurations including various agitation means to prevent feed bridging and lodging in the passageways of the feeder. In addition, the prior art feeder assemblies attempt to teach means for eliminating feed contamination and feed spoilage. However, the prior art does not disclose an animal feeder which satisfactorily achieves these results.

Shortcomings in the prior art animal feeder can be characterized by the following related deficiencies; (1) excessive feed flow, (2) feed contamination, (3) the use of mechanical devices, (4) animal trapping and (5) incomplete feed clean out. The problem of excessive feed flow results from an overly responsive feed action mechanism, generally actuatable by an animal, causing an excess accumulation of feed in the eating area. This excess accumulation of feed eventually leads to feed waste and contamination. The problem of feed contamination is further increased by open eating areas where troughs without dividers or, troughs equipped with high profile dividers, allow feed rooting by the animals. As previously mentioned, the prior art discloses the use of various agitation means for facilitating the flow of feed from the hopper to the trough. However, since these agitation means are generally mechanical devices which are subject to corrosion by moisture, salt in the feed, animal saliva and manure acids they further add to the problem of feed contamination and, in addition, require continual maintenance to remain in operable condition.

Another problem associated with the prior art feeder assemblies is that of animal trapping. The prior art frequently discloses the use of hopper panels which are swingable at relatively large angles by feeding animals, generally in association with an attached agitator, and the use of divider straps which are located high over the eating area to partition the troughs into separate eating sections. It has been found from experience that both of these features often serve to physically trap an animal within the eating area of the feeder. The final prior art deficiency is that of incomplete feed clean out. Incomplete feed clean out occurs when feed becomes lodged within the hopper passage way leading to the trough and cannot be disrupted therefrom in the normal course of activities. The prior art design deficiencies which cause incomplete feed clean out include a deflection surface intermediate the hopper and trough having too shallow of a slope wherein the angle of the slope is less than the angle of repose of the feed and hoppers having large inlets tapering down to smaller passage ways wherein feed frequently becomes compacted and accumulatively lodged.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide an animal feeding device adapted to continuously deliver a controlled amount of feed to an animal eating area. By providing a controlled amount of feed flow, feed contamination and spoilage is greatly reduced.

It is a further object of the present invention to provide means in an animal feeder which eliminates the problem of feed contamination due to animal rooting. Yet another object of the present invention is to provide an animal feeder having virtually no mechanical devices so as to largely reduce feed contamination and frequent feeder maintenance due to corrosion.

Still another object of the present invention is to provide an animal feeder exhibiting a minimum propensity for trapping feeding animals.

A final specific object of the present invention is to provide an animal feeder wherein complete feed clean out from the feeder hopper to the feeder trough is greatly facilitated.

In accordance with these and other useful objects there is provided an animal feeder having an open lid hopper in communication with a downwardly depending trough eating area. The hopper comprises a pair of oppositely facing side walls, a vertical rear wall extending therebetween and a swingable V-shaped front partition. The swingable front partition, which is operable by a feeding animal, is hingedly secured to the side walls with the upper section thereof being downwardly disposed toward the hopper rear wall by at least the angle of repose of the feed in use. The lower section of the swingable front partition, when undisturbed by feeding animals, is maintained in a parallel spaced relationship with respect to the vertical rear wall by a stop secured to the side walls on the outside of the hopper.

The trough is located beneath the hopper and includes a rear portion depending from the vertical rear wall and upwardly disposed from the trough's substantially horizontal base portion by at least the angle of repose of the feed.

The front portion of the feeder trough projects upwardly and outwardly from the feeder base and includes a transverse edge, intermediate the feeder side walls, having a plurality of eye means. A plurality of low profile divider bars having hooked means at one end thereof for engagement with a respective eye slope downwardly from the trough front portion edge and make a loose fit extension into the hopper.

The lower section of the swingable front partition is maintained at a predetermined height above the trough base portion and at a predetermined distance behind the trough rear portion so that, in conjunction with the various slopes of the hopper and trough walls, a controlled feed flow is achieved. Also, the low profile divider bars are maintained in close proximity to the trough base portion so as to reduce animal rooting and trapping problems. Finally, the divider bar extensions in the hopper along with the inwardly swingable front partition function as agitator means to assure complete feed clean out in the hopper portion of the feeder.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the assembled animal feeder of the present invention.

FIG. 2 is a cross-sectional side elevation view of the animal feeder of the present invention taken along the line 2-2 of FIG. 1.

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FIG. 3 is a side elevation view of the trough and vertical rear wall assembly of the animal feeder of the present invention.

FIG. 4 is a side elevation view of the swingable front partition of the animal feeder of the present invention.

FIG. 5 is a side elevation view of one of the low profile divider bars of the animal feeder of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawings, wherein like numerals identify corresponding components, FIG. 1 shows, in perspective, the animal feeder of the present invention generally indicated at 10. The feeder 10 comprises a hopper generally indicated as at 11 and a trough generally indicated as at 12. Two oppositely facing said walls 13 and 14 provide support for the feeder 10 and serve to define the transverse dimensions of the hopper 11 and trough 12. The side wall 13 may include flanged members 15 and 16 to facilitate securement thereto of the hopper 11 and trough 12 by suitable means such as a rivoting. Similarly, side wall 14 may include flanged members 17 and 18.

The hopper 11, in addition to the side walls 13 and 14, includes a vertical rear wall 19 and a swingable V-shaped partition 20 having an upper section 21 and a lower section 22. The upper section 21 of the front partition 20 terminates in a hook means 23 adapted to hingedly engage a pivot rod 24 extending through a pair of axially aligned apertures 25 and 26 in respectively side walls 13 and 14. Additional axially aligned aperture pairs, such as 27 and 28, 29 and 30, 31 and 32 and 33 and 34, may be included in the side walls 13 and 14 to provide a height adjustment capability for the front partition 20.

The trough 12 includes a substantially horizontal base portion 35, an upwardly and outwardly projecting front portion 36 and a rear portion 37 depending from the vertical rear wall 19 and angularly disposed from the base portion 35.

In order to assure a free flow of feed from the hopper 11 to the trough 12 it has been discovered that all surfaces associated with feed travel should have slopes at least that of the angle of repose of the feed. The angle of repose is an inherent characteristic of a bulk material, relating to its flowability, and is measured by the angle that the surface of a normal, freely formed pile of the material makes to the horizontal. The angle of repose of fine ground feed or high moisture corn is approximately 40° and will therefore slide freely on an incline plane of 45° or more. Accordingly, a stop rod 38, extending intermediate the side walls 13 and 14 and secured thereto, is positioned adjacent the front partition lower section 22 such that, when no external forces are applied to the front partition 20 by feeding animals, the stop rod 38 will be in abutment with the front partition lower section 22. The front partition 20 is appropriately configured so that when it abuts the stop rod 38 the upper section 21 will be downwardly disposed from the horizontal (indicated by dotted line L) by at least the angle of repose of the feed, see angle A in FIG. 2, while the lower section 22 is maintained in parallel spaced relationship with respect to the vertical rear wall 19. Furthermore, the trough 12 is configured so that the rear portion 37 is disposed from the base portion 35, see angle B of FIG. 2, by at least the angle of repose of the feed. It has been found that excellent

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feed flow is achieved by configuring the feeder 10 so as to make angle A equal approximately 60° and angle B approximately 45°. In this manner, the 60° slope of the top section 21, the 90° straight fall or parallel configuration of the rear wall 19 with respect to the lower section 22 and the 45° slope of the trough rear portion 37 are all greater than the angle of repose of the feed and will allow the feed to flow freely from the hopper 11, passed the trough rear portion 37, which serves as a deflection surface, and to the horizontal portion 35 of the trough 12.

The amount of feed delivered to the trough 12 for consumption by feeding animals is controlled by the height h of the front partition lower section 22 above the horizontal base portion 35 of the trough 12. The height h can be adjusted to a desired level by extending the pivot rod 24 through an appropriate pair of the plurality of apertures 27 through 34. It is clearly evident that by increasing the height h the amount of feed being delivered from the hopper 11 to the trough 12 is increased. Since excessive feed in the trough 12 frequently leads to spoilage and contamination, the height h , is preferably adjusted so that the feed can accumulate only part way along the trough base portion 35. Furthermore, in order to insure that the only factors effecting feed flow control are the angle of repose of the feed and the height h , the front partition lower section 22 must terminate over the trough base portion 35. In other words, the front partition 20 and the stop rod 38 must be so configured as to insure the existence of distance d , see FIG. 2, along the trough base portion 35.

A plurality of low profile divider bars 39, 40 and 41 are provided for a triad of purposes. Initially, the divider bars 39, 40 and 41 are located in close proximity to the trough base portion 35 so as to prevent feed contamination by animal rooting. In addition, the divider bars 39, 40 and 41 serve as agitation means for feed in the hopper 11 and also serve as a stop for the inwardly swingable front partition 20.

Each of the low profile divider bars 39, 40 and 41 has a hook portion 42 extending through a respective one of a plurality of eyes 43, 44 and 45 located in the edge 46 of the trough front portion 36. In order to secure each divider bar to its respective eye the hook portion 42 is bent to a position such as shown at 47 in FIG. 5. Each of the low profile divider bars 39, 40 and 41 include four main sections 48, 49, 50 and 51 (see FIG. 5). The first section 48 of each divider bar slopes downwardly from the edge 46 to a point in close proximity to the trough base portion 35. From this latter position a second section 49 extends substantially upwards to a level wherein it is in alignment with a respective one of the apertures 52, 53 and 54 located in the lower portion of the front partition lower section 22. A third section 50 then makes a substantially horizontal loose fit extension through a respective one of the apertures 52, 53 and 54 terminating at a location intermediate the vertical rear wall 19 and the front partition 20. A final or fourth section 51 extends substantially vertically from this latter location intermediate the vertical rear wall 19 and the front partition 20.

To expose the full eating area, i.e., the base portion 35 and the rear portion 37 of the trough 12, of the feeder 10 a feeding animal must abut against the front partition 20 causing it to assume a position as shown at 52. In addition to making available the entire feeding area to the animal this swingable action of the front

partition also disturbs any feed lodged in the hopper 11 allowing it to freely flow to the eating area. The fourth section 51 of the low profile divider bars 39, 40 and 41 serve as a stop means to control the extent of potential swing of the front partition 20. Further agitation of feed stored in the hopper 11 is provided by movements of divider bar sections 50 caused by feeding animals coming into contact with divider bar sections 48. The loose fit extensions of divider bar sections 50 through apertures 52, 53 and 54 facilitate the movement of divider bar sections 51 in the hopper 11.

The low profile divider bars 39, 40 and 41 can be constructed in the form of round wire bars which are physically uncomfortable to smaller animals to prevent the latter from laying in the eating area and thereby contaminating the feed. Also, since the divider bars 39, 40 and 41 are located in close proximity to the trough base portion 35, contamination of feed resulting from animals rooting feed from one trough section to another is prevented.

The low profile design of divider bars 39, 40 and 41 also serve to reduce the possibility of animal trapping in the trough 12 since the average size animal will not be able to lodge himself underneath the bars. Furthermore, due to the relatively small opening between the front partition lower section 22 and the trough base portion 35 the average size animal will not be able to burrow his head into the hopper 11 area and become entrapped therein.

The details described herein have been by way of example only and it will be understood that many modifications may be made without departing from the spirit of the invention. Therefore, no limitations not expressly set forth in the claims is intended or should be implied.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. An animal feeder for delivering feed comprising:
 - a. a pair of oppositely facing side walls each having an upper and a lower end,
 - b. a trough extending between said side walls and secured thereto at said lower ends, said trough having a substantially horizontal base portion with front and rear portions projecting upwardly and outwardly therefrom,
 - c. a vertical rear wall extending between said side walls and upwardly from the outermost edge of said trough rear portion,
 - d. stop means secured to at least one of said side walls, and
 - e. a partition extending between said side walls, said partition having an upper section and a lower section, said upper section being hingedly secured to said side walls at a position near said upper ends thereof and opposite said vertical rear wall, said partition having a normal position when no external forces are applied thereto wherein the side thereof facing away from said vertical rear wall is in abutment with said stop means such that said upper section is angularly disposed downwardly and rearwardly from a horizontal through said hinged position, said lower section extending downwardly from the rearwardmost edge of said upper section in parallel spaced relationship with said vertical rear wall part way into said trough such that it would intersect said trough base portion at a point near said trough rear portion whereby, said parti-

tion is swingable between said normal position and a second position wherein said partition approaches said rear wall.

2. An animal feeder in accordance with claim 1, wherein said stop means comprises a support rod horizontally extending between said side walls and fixedly secured thereto, said support rod being in abutment with said lower section of said partition at a location near said rearward most edge of said upper section when said partition is in said normal position.

3. An animal feeder in accordance with claim 1, including an axially aligned first aperture in each of said side walls at said hinged positions thereof, a pivot rod extending between said side walls and through said axially aligned first apertures, and a looped section terminating the forward most edge of said partition upper section, said looped section swingably engaging said pivot rod whereby said partition is hingedly secured to said side walls.

4. An animal feeder in accordance with claim 3 including a plurality of additional pairs of axially aligned apertures in said side walls at said hinged position thereof, each pair of said additional axially aligned apertures being adapted to receive said pivot rod such that each of said axially aligned aperture pairs defines a different level of extension of said partition lower section part way into said trough.

5. An animal feeder in accordance with claim 1 wherein said trough rear portion is disposed from said trough base portion by approximately 45°.

6. An animal feeder in accordance with claim 1, wherein in said normal position of said partition said upper section thereof is disposed from said horizontal through said hinged position by approximately 60°.

7. An animal feeder in accordance with claim 1, including at least one aperture in said partition lower section, said at least one aperture being located slightly above the edge of said lower section extending into said trough, and at least one divider bar secured to the outer most edge of said trough front portion and sloping downwardly therefrom towards said partition, said at least one divider bar having a loose fit extension through said at least one aperture to a point intermediate said partition and said vertical rear wall.

8. An animal feeder in accordance with claim 7 wherein said at least one divider bar comprises a first section having first and second ends, said first section having said first end thereof secured to said outer most edge of said trough front portion and sloping downwardly therefrom toward said partition such that said second end of said divider bar first section is located below said at least one aperture and on the side of said partition facing away from said vertical rear wall, a second section extending substantially upward from said second end of said divider bar first section and terminating at a point in alignment with said at least one aperture, a third section having a loose fit extension from said termination of said second section substantially horizontally through said at least one aperture and terminating at a point intermediate said partition and said vertical rear wall and a fourth section extending substantially upwardly from said termination of said divider bar third section, said fourth section being substantially in parallel spaced relationship with said vertical rear wall whereby said partition is swingable between said normal position and a position defined by the location of said divider bar fourth section.

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9. An animal feeder in accordance with claim 8, wherein said outer most edge of said trough front portion includes at least one eye and said first end of said at least one divider bar first section includes a hook means, said hook means of said divider bar first section being adapted to engage said at least one eye whereby said divider bar first section is secured to said outer most edge of said trough front portion.

10. An animal feeder in accordance with claim 7, wherein said at least one divider bar comprises a round wire bar in close proximity to said trough base portion.

11. An animal feeder in accordance with claim 7 wherein said at least one aperture comprises a plurality of apertures substantially evenly spaced along the length of said partition lower section and said at least one divider bar comprises a respective plurality of divider bars.

12. An animal feeder for delivering feed comprising:
a. a pair of opposedly facing side walls each having an upper and a lower end;

b. a trough extending between said side walls and secured thereto at said lower ends, said trough having a substantially horizontal base portion with front and rear portions projecting upwardly and outwardly therefrom,

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c. a vertical rear wall extending between said side walls and upwardly from the outermost edge of said trough rear portion,

d. a partition extending between said side walls, said partition having an upper section and a lower section, said upper section being secured to said side walls at a position near said upper ends thereof and opposite said vertical rear wall, said upper section being angularly disposed downwardly and rearwardly from a horizontal through said secured position and said lower section extending downwardly from the rearwardmost edge of said upper section in parallel spaced relationship with said vertical rear wall part way into said trough such that it would intersect said trough base portion at a point near said trough rear portion, said partition lower section having at least one aperture located slightly above the edge of said lower section extending into said trough, and

e. at least one divider bar secured to the outermost edge of said trough front portion and sloping downwardly therefrom toward said partition, said at least one divider bar having a loose fit extension through said aperture to a point intermediate said partition and said vertical rear wall.

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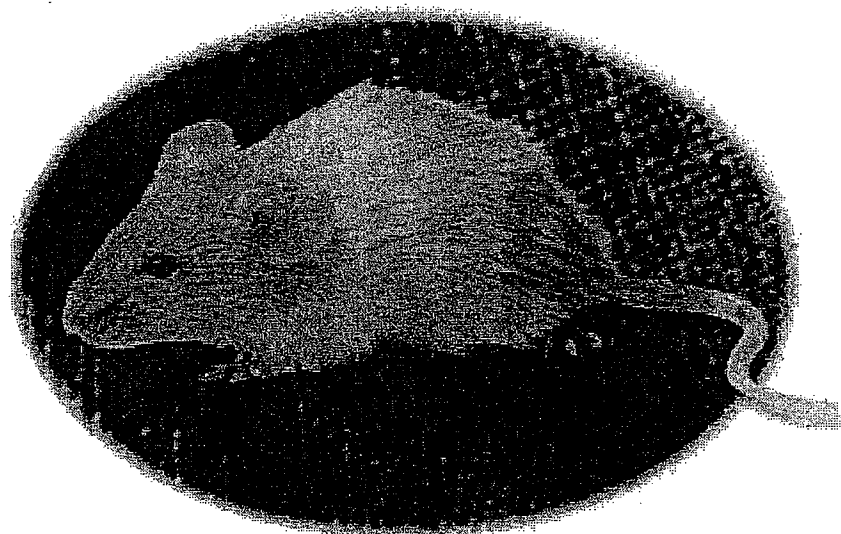
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