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A1M MEA

(56) Documents Cited:
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EP 0005881 A **CA 002273712 A**
CH 000667368 A **DE 003707537 A**
US 4976222 A **US 1018095 A**

(58) Field of Search:
UK CL (Edition X) **A1M**
INT CL⁷ **A01K**
Other: **EPODOC, WPI**

(54) Abstract Title: **A hay feeder with a hinged thrust plate pushing feed up against a meshed cover**

(57) A hay feeder comprises a bowl type holding vessel 2 with a grid or mesh feed cover 5. The cover may be hinged to the upper edge of the vessel and fitted with a locking device. A thrust plate 3 is mounted to the feeder with a hinge 4 and fitted with a spring 16. Loading fodder into the feeder, the thrust plate is pushed down against the action of the spring and held in position with stop bolt 14. The hay is then placed in the feeder and the thrust plate released, ensuring that the feed is kept in contact with the feed cover. The thrust plate may be fitted with a rear access door. The feeder may be hinge mounted to allow it to be swung to a position outside of the confines of the stable. The feeder may be wall mounted and even shaped to fit into a corner position.

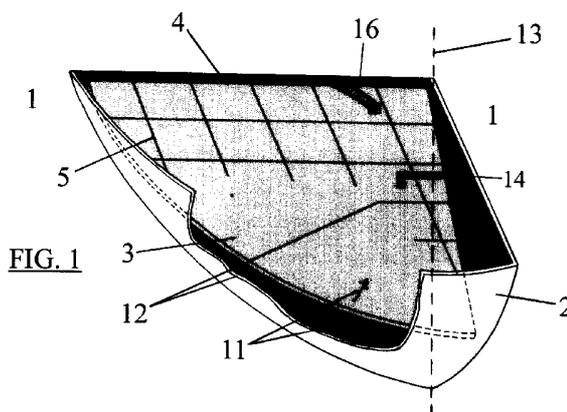


FIG. 1

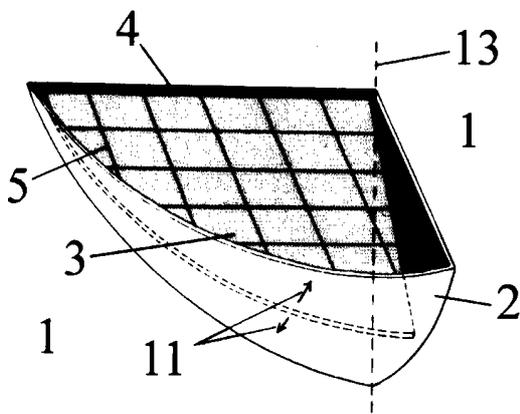
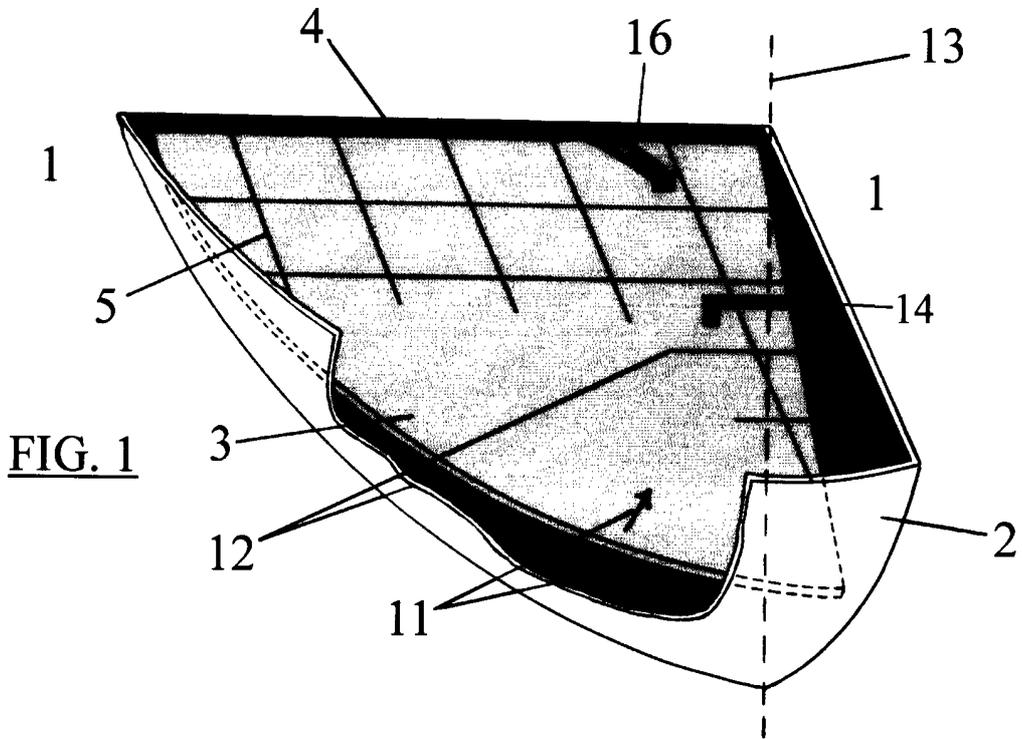


FIG. 2

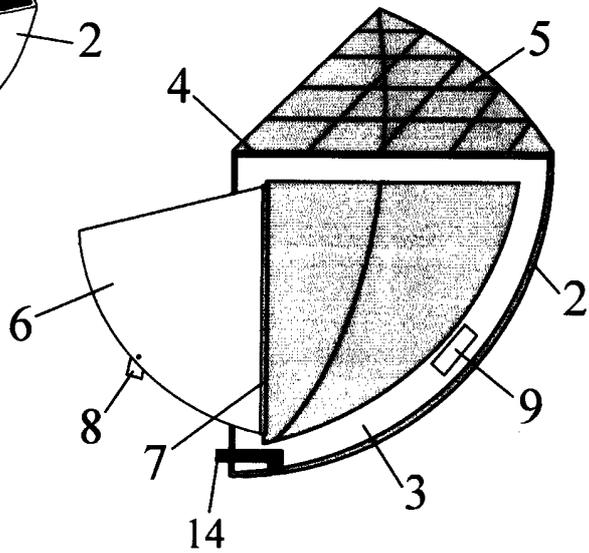


FIG. 3

FIG. 4

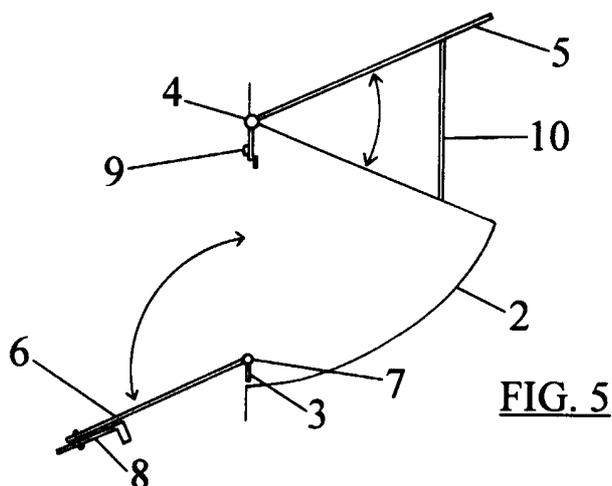
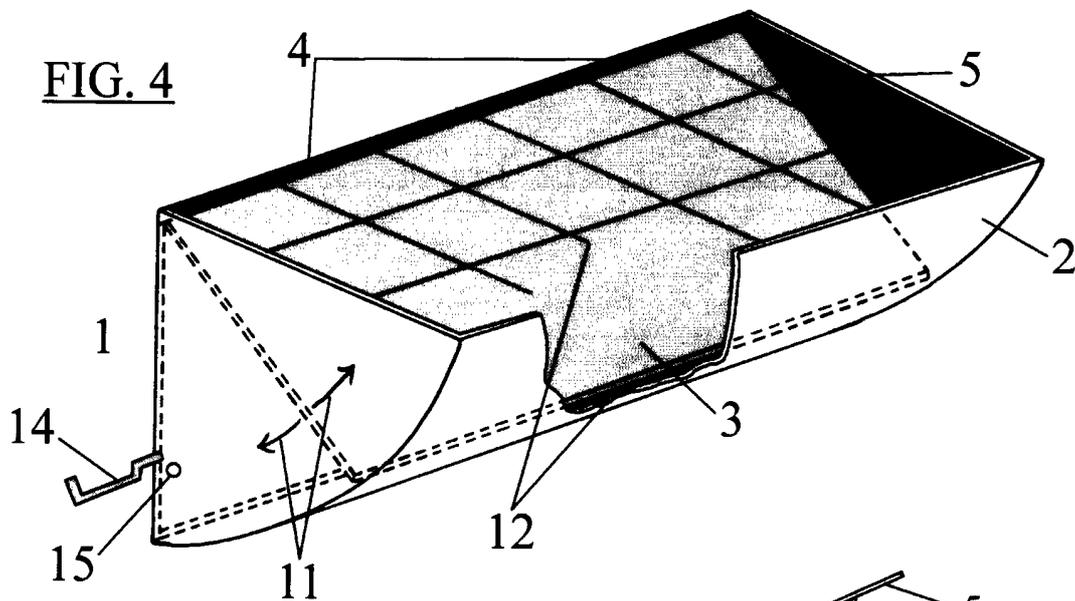


FIG. 5

FIG. 6

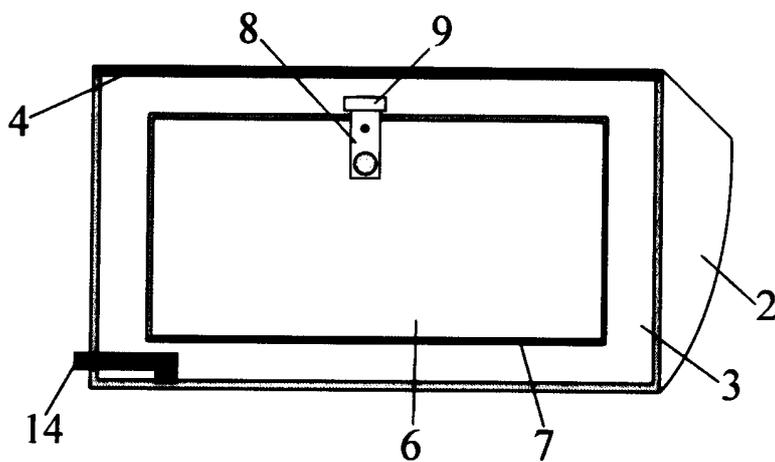


FIG. 7

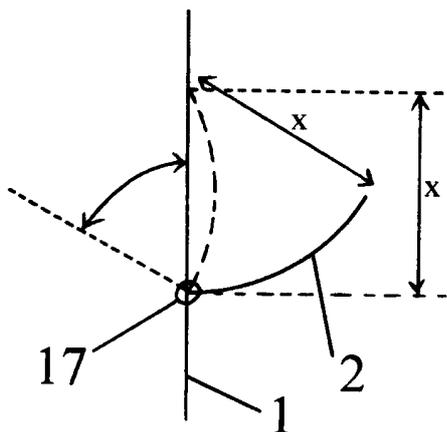
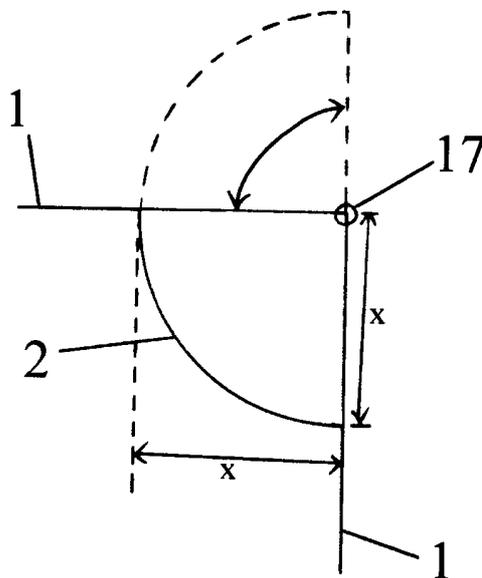


FIG. 8

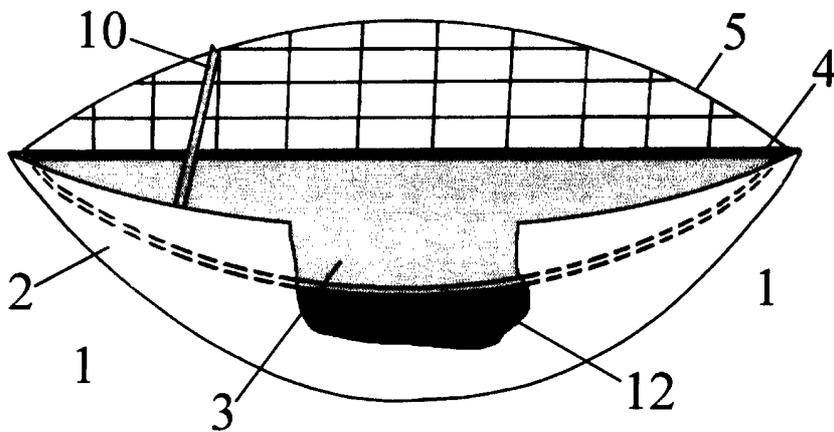


FIG. 9

DESCRIPTION

Hay Feeder

Background

This device holds animal feed material in a vessel, so that the intended animals can feed without rooting into it or pulling out large amounts of the feed that can drop onto the ground. If the feed is dropped onto the ground it may be wasted or pick up contaminants which may be ingested by the animal later. It has been developed with the specific aim of feeding hay to horses in stable boxes, but could be used and adapted for other animals and other feed materials in other environments.

The feeder uses a bowl type holding vessel which holds the hay. There is a grid or mesh top feed cover which fits around the top rim of the holding vessel to contain the hay. The feed cover may be hinged to the holding vessel along one edge, so that it can be lifted open to allow access into the vessel. In the instance of the feed cover being hinged it would need a fixing device to lock it down in the closed position, flush with the top rim of the holding vessel, so preventing the animal from lifting it. The size of the holes in the feed cover will allow the intended animal to feed adequately through it, whilst preventing it from rooting in the hay and pulling out too much at a time. The mesh or grid will be contained in a frame around its perimeter and the whole cover must be strong enough to prevent the intended animal from unduly bending or deforming it.

A thrust plate will act to force the hay up against the feed cover, and so presenting it to the animal for eating. The thrust plate takes the shape and place of a side wall of the holding vessel, but being a little smaller around its perimeter to leave a small gap between it and the surrounding holding vessel walls. This is to allow for free movement of the thrust plate inside the vessel. The thrust plate has a sprung hinge along its top edge which joins to the top rim of the holding vessel. The sprung hinge exerts force to rotate and push the thrust plate upwards against the feed cover and so presenting the hay through it. As the volume of hay diminishes, so the thrust plate moves up. A rear access door may be located in the thrust plate to allow entry into the holding vessel through the thrust plate when it is in the open position.

The thrust plate would be depressed back to the open position by the operative pushing from above or pulling from behind the vessel. A ratchet mechanism may be fitted so that it can be engaged during this procedure to prevent the thrust plate from springing back. When the plate reaches its stop point a stop bolt can be engaged hold it back. While stopped in this open position the vessel can be accessed for reasons such as filling with hay or cleaning. This can be done by lifting the feed cover or opening the rear access door in the thrust plate depending on which is fitted. Disengaging the stop bolt, and the ratchet if fitted, will allow the action of the sprung hinge to force the thrust plate upwards towards the mesh feed cover.

It may be necessary to remove a section of the stable wall behind the feeder to facilitate the appropriate access depending upon the feeder design. The feeder may be situated mid-wall which means away from walls at either side; or in the corner of two walls. It will be possible in some situations to fit the feeder body with a hinge that allows it to swing outside the stable.

The feeding device will be made from plastics material, metal or wood, or from a combination of these materials.

DESCRIPTION

Hay Feeder

The Drawings

What the Numbers describe:

- 1/ Stable wall for fixing the feeder to.
- 2/ Holding vessel.
- 3/ Thrust plate.
- 4/ Thrust plate hinge.
- 5/ Grid or mesh feed cover.
- 6/ Rear access door.
- 7/ Rear access door hinge.
- 8/ Rear access door locking bolt.
- 9/ Rear access door locking bolt catch.
- 10/ Support strut for hinged feed cover.
- 11/ Arrows indicating the possible directions of movement of the thrust plate.
- 12/ Edge of a section that has been cut away purely for illustrative purposes.
- 13/ Corner of two walls.
- 14/ Stop bolt.
- 15/ Stop bolt hole found in feeder design where access to holding vessel is gained by lifting the feed cover.
- 16/ Gate type spring which is one example of the way in which the thrust plate hinge maybe sprung.
- 17/ Feeder body hinge allowing the feeder to swing outside the stable/supporting wall.

What the Figures describe

- FIG. 1 Angled view from above and to the side of a corner fitted feeder featuring a section that has been cut away purely for illustrative purposes.
- FIG. 2 As above, but without cut away section.
- FIG. 3 Angled view from behind and above a corner fitted feeder showing the thrust plate bolted in the open position with the rear access door open.
- FIG. 4 Angled view from above and to the side of a feeder where the shape would derive from a 90° (or less) radial section of a cylinder.
- FIG. 5 Horizontal cross section of the feeder featured in FIG. 4 showing the thrust plate in the open position and the rear access door open.
- FIG. 6 Angled view from behind and to the side of the feeder featured in FIG. 4 showing the thrust plate bolted in the open position with the rear access door bolted shut.
- FIG. 7 View from above a corner fitted feeder showing how it maybe swung out of the stable.
- FIG. 8 View from the side of the feeder featured in FIG. 4 showing how it maybe swung out of the stable.
- FIG. 9 Angled view from above and to the front of an alternate shape for a mid-wall feeder.

DESCRIPTION

Hay Feeder

Method of Operation

A) Procedures using the feed cover (5) for accessing the holding vessel

When the feeder requires filling the operative lifts up the feed cover (5) to gain access to the holding vessel (2). For this the feed cover can be fitted with a hinge which is attached along one side to the top rim of the holding vessel. The support strut (10) can then be used to hold the feed cover open.

The thrust plate (3) will then be pushed down by the operative and locked in the open position by locating the stop bolt (14) in the stop bolt hole (15).

The operative will then put the required amount of hay into the holding vessel and push down the feed cover so that it locks down flush with the top rim of the holding vessel so containing the hay. For this the frame of the feed cover can be fitted with a bolt which can be engaged with the holding vessel when the feed cover is in the closed position. The stop bolt (14) will then be released to allow the thrust plate to push the hay up against the feed cover.

B) Procedures using the rear access door (5) for accessing the holding vessel

When the feeder requires filling the operative accesses the holding vessel (2) from the back and pulls the thrust plate (3) down to the open position. It will then be locked in the open position by engaging the stop bolt (14) to the outer rim of the holding vessel.

The rear access door (6) can then be opened to gain access to the holding vessel. The operative will then put the required amount of hay into the holding vessel and then bolt (8) the rear access door closed. The stop bolt (14) will then be released to allow the thrust plate to push the hay up against the feed cover (5).

Procedures common to all designs

As the volume of hay diminishes due to the animal eating it, the thrust plate (3) moves up. This is because of the force of the sprung hinge (4) acting against the reducing back pressure of the hay above it. When the holding vessel (2) is empty of hay the thrust plate comes to rest against feed cover (5).

The feeder may be situated mid-wall, away from walls at either side; or in the corner of two walls. There are several possibilities for the shape of the device and FIG. 1, FIG. 4 and FIG. 9 are three examples. FIG. 1 would be most suited to a corner fitting. FIG. 4 could be fitted either mid-wall or in a corner. FIG. 9 would be most suited to a mid-wall fitting.

The feeder body may be fitted with a hinge (17) that allows it to swing to the outside of the stable. This may be useful for accessing the feeder without having to enter the stable and for leaving the feeder outside the stable when it is not wanted inside the stable.

CLAIMS

Hay Feeder

- 1/ An animal feeder that comprises a bowl type holding vessel with a mesh or grid top feed cover which contains the feed material, whilst allowing the feeding animal to remove the feed material through it.
- 2/ An animal feeder as claimed in Claim 1 where a thrust plate is joined with one side of the top rim of the holding vessel by a sprung hinge which acts to force the thrust plate to rotate from the back of the holding vessel up to the feed cover.
- 3/ An animal feeder as claimed in Claim 2 where the thrust plate fills the whole area of the cross section of the holding vessel in which it moves with just a small gap around its edge to allow for free movement.
- 4/ An animal feeder as claimed in Claim 3 where the action of the sprung hinge on the thrust plate causes the feed material placed in the feeder to be pushed up against the feed cover.
- 5/ An animal feeder as claimed in Claim 4 where the thrust plate moves up as the feed material reduces in volume due to the action of the sprung hinge.
- 6/ An animal feeder as claimed in Claim 5 where the thrust plate can be pushed or pulled down and back into the open position by the operative.
- 7/ An animal feeder as claimed in Claim 6 where the thrust plate can be locked in the open position to allow for access to the inside of the holding vessel.
- 8/ An animal feeder as claimed in Claim 7 where the thrust plate and holding vessel can be fitted with a ratchet mechanism which will stop the thrust plate from springing back up unless it is disengaged.
- 9/ An animal feeder as claimed in any preceeding claim where the feed cover maybe hinged along one side to the top rim of the holding vessel so that it maybe lifted to gain access to the holding vessel.
- 10/ An animal feeder as claimed in any preceeding claim where the thrust plate may contain a rear access door that can be used, while the thrust plate is open, to gain access to the holding vessel.
- 11/ An animal feeder as claimed in any preceeding claim where the feed cover is made of a mesh or grid with a frame around its perimeter, with holes or gaps large enough to allow the animal to feed through it adequately.

CLAIMS

Hay Feeder

- 12/ An animal feeder as claimed in any preceding claim where the feed cover is made of a mesh or grid with a frame around its perimeter, with holes or gaps small enough to prevent the animal from rooting in the feed material and pulling out too much at a time.
- 13/ An animal feeder as claimed in any preceding claim where its fabrication is strong enough to prevent it from being unduly bent or deformed during normal use.
- 14/ An animal feeder as claimed in any preceding claim where the body of the feeder may be mounted with a hinge to allow it to be swung outside the stable if it is not required in the stable, or if access to it is preferred outside rather than inside the stable.
- 15/ An animal feeder as claimed in any preceding claim where the feeder may be situated mid-wall which means away from walls at either side; or in the corner of two walls.
- 16/ An animal feeder as claimed in any preceding claim where the body of the feeder can take a variety of shapes.
- 17/ An animal feeder as claimed in any preceding claim which is made from plastics material, metal or wood, or from a combination of these materials.
- 18/ An animal feeder substantially as herein described above and illustrated in the accompanying drawings.



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Application No: GB0512249.4

Examiner: Philip J. Roe .

Claims searched: 1 - 18

Date of search: 1 September 2005

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1, 9, 11-13 & 17	US 1018095 A (BROWN) see whole document
X	1, 9, 11-13 & 17	DE 3707537 A (ULLSTEIN) see WPI Abstract Accession No. 1988/271678-37 and all figures
X	1, 9, 11-13 & 17	CH 667368 A (KNECHTLE) see WPI Abstract Accession No. 1988/323170-37 and all figures
X	1, 9, 11-13 & 17	EP 0231822 A3 (VAN VUGHT) see WPI Abstract Accession No. 1987/222132-25
X	1, 9, 11-13 & 17	EP 0005881 A (SNEL & KUUS) see whole document
X	1, 9, 11-13 & 17	GB 2351001 A (HOLLIDAY) see whole document
X	1, 11-13, 15 & 17	US 4976222 A (COOKE) see whole document
X	1 & 14	CA 2273712 A (AKINS) see whole document

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.



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Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^X :

A1M

Worldwide search of patent documents classified in the following areas of the IPC⁰⁷

A01K

The following online and other databases have been used in the preparation of this search report

EPODOC, WPI