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(54) Title: A METHOD OF FILLING FEEDING PANS AS WELL AS A FEEDING SYSTEM

(57) Abstract: A feeding system for freely moving poultry or other small animals, comprising a feeding pan (1) having an outer distribution cone (7), wherein an overlying horizontal transport channel (5) for feed is provided above the distribution cone (7), wherein a passage for regular feeding (10) out of the transport channel (5) is provided, and wherein the feed, when passing there through, passes through the opening (11) at the top of the distribution cone (7) to the inner side of the distribution cone (7). Advantageously, and prior to the passage for regular feeding (10) in the direction of movement of the feed, there is a passage for initial feeding (9) out of the transport channel (5), arranged such that the feed passes out of the initial feeding passage and impinges on separate chutes (14, 15) externally on the distribution cone (7), a dividing line (18, 38) between the two chutes (14, 15) being provided in the distribution cone (7).



A method of filling feeding pans as well as a feeding system

The invention relates to a method of filling feeding pans for poultry or other freely moving small animals as well as a feeding system, wherein the feed is conveyed to  
5 a feeding pan from an overlying horizontal transport channel, in which the feed is transported in a direction of transport and forwardly to successive feeding pans along the transport channel, wherein feed is conveyed either to an external side of a distribution cone in the feeding pan, out through a passage in the transport channel for initial feeding, or, alternatively, is conveyed out through a passage in  
10 the transport channel for regular feeding and through an opening in the top of the distribution cone to the inner side of the distribution cone.

Such a system is already known from e.g. DK 1152658, and the system described therein has the problem that the feed conveyed to the outer side of the distribution  
15 cone drops down along the cone face, so that it is not distributed along the upper rim of the pan. Therefore, the chicks will have limited access to the feed.

DK 2000 00242 U3 discloses a feeding system for feeding poultry, in particular hens and chicks, said system comprising a feed pipe (20) with a plurality of feeding  
20 pans, a feed silo or a similar store for feed as well as a transport system for the feed through the feed pipe to the feeding pans, said feed pipe being rotatable about its longitudinal axis and comprising a feed outlet hole for each pan as well as comprising at least one additional feed outlet hole at at least one feeding pan. The at least one additional outlet hole for initial feeding precedes the ordinary outlet  
25 hole in the direction of movement of the feed in the pipe, said pipe being rotatable for positioning the one or the other outlet hole in a direction toward the feeding pan.

Therefore, there is a desire for a technique which ensures that a greater part of the feed is distributed along the rim of the feeding pan and, in particular, is conveyed further away from the passage or the opening for initial feeding. There is also a desire for a system which consists of few parts, is easy to operate, and which may  
5 be assembled around a transport pipe without the use of tools, and such that this takes place without any risk of error mounting.

The object of the invention is achieved by a method of the type defined in the introductory portion of claim 1, which is characterized in that the feed in the  
10 transport channel in the direction of transport passes past the passage for initial feeding before it reaches the passage for regular feeding, so that the feed passes out through the passage for initial feeding with a speed component in the longitudinal direction of the transport channel corresponding to a feed speed of the feed in the transport channel and a speed component corresponding to free fall, as  
15 it is received by an upright partition line, and, because of the speed component in the longitudinal direction of the transport channel, is sent in separate flows of material along chute faces on the external face of the distribution cone and is distributed by skidding along its respective one of chute faces to the periphery of the feeding pan.

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This ensures that the feed is distributed along two diametrically opposed rim parts disposed on their respective sides of an opening in the top of the distribution cone, thereby making it possible to ensure that an essential part of the periphery of the feeding pan is covered with feed. It is e.g. possible to provide two chute faces,  
25 which extend from their respective sides of the partition line and down the distribution cone toward the rim of the feeding pan.

Expedient embodiments of the invention are defined in claims 2 to 4.

As mentioned, the invention also relates to a feeding system for freely moving poultry or other small animals comprising a feeding pan, which has an outer  
5 distribution cone with a central raised part and a hole in the central raised part as well as a skirt, which fits into the feeding pan within and below the upper edge of a raised rim associated with the feeding pan, and wherein an overlying horizontal transport channel for feed is provided above the distribution cone, a passage for regular feeding out of the transport channel being provided, wherein the feed,  
10 when passing through it, passes through the opening at the top of the distribution cone to the inner side of the distribution cone.

The feeding system is characterized in that, prior to the passage for regular feeding in the direction of movement of the feed, there is a passage for initial feeding out of  
15 the transport channel, arranged such that the feed passes out of the initial feeding passage and impinges on a separate chutes externally on the distribution cone, a dividing line between the two chutes being present in the distribution cone. Hereby, it is possible to divide the flow of material formed by the feed into separate flows of material, which may be conveyed along the chutes to their respective sides of the opening in the raised part or top of the distribution cone, and, thereby, a  
20 considerably greater portion of the rim of the feeding pan may be covered with feed during the initial feeding. This ensures that as many chicks as possible have access to the feed, so that all the chicks will rapidly begin to start eating and to grow. This additionally ensures that all the chicks rapidly learn that the feed is  
25 present in the feeding pan all the way round along its rim when the initial feeding phase is ended.

Advantageous embodiments of the feeding system are defined in claims 6 – 11.

The invention will now be explained more fully with reference to the drawings, in which:

5

Fig. 1 shows a 3d representation of an example of a feeding pan according to the invention,

Fig. 2 shows a section through a feeding pan corresponding to the one shown in Fig. 1,

10 Fig. 3 is a sectional view corresponding to the view in Fig. 2, but where an initial feeding has been initiated,

Fig. 4 shows a top plan view of the situation in Fig. 3,

Fig. 5 shows an exploded drawing in lateral view of the feeding pan of Fig. 1,

Fig. 6 the outer cone seen alone and from above,

15 Fig. 7 is a sectional view from the side corresponding to the view in Fig. 2, but now in a state with normal feeding,

Fig. 8 is a 3d representation of the screen part,

Fig. 9 is the same screen part as shown in Fig. 8, but seen from another angle,

Fig. 10 shows the locking ring in a 3d representation,

20 Fig. 11 is the locking ring shown in Fig. 10, but seen from another angle,

Fig. 12 is a lateral view of the pipe seen from the side, with concealed contours shown in dashed weakened line,

Fig. 13 shows the cone cut through, but in a 3d representation,

Fig. 14 shows the assembly of pipe, top and cone from the end in a first position,

Fig. 15 is the same elements as in Fig. 14, but now with the pipe and the ring rotated to a position for filling of the feeding pan,

- 5 Fig. 16 is the same elements as in Fig. 15, but now with the pipe and the ring rotated for initial feeding and covering of the area around the feeding pan with feed,

Fig. 17 shows a plurality of feeding pans on a length of pipe in the same position as shown in Fig. 15,

- 10 Fig. 18 shows the feeding pans of Fig. 17, but now in the same position as shown in Fig. 16,

Fig. 19 shows the feeding pans of Fig. 17, but now in the same position as indicated in Fig. 14, and

- 15 Fig. 20 shows the feeding pans rotated a distance together with the pipe to a washing position.

A feeding pan 1 for poultry or other freely moving small animals is shown in Fig. 1.

- 20 The feeding pan 1 has a round base pan, and the sectional view in Fig. 2 shows that the pan 1 has a raised annular rim 2 and an arched central portion shaped as a cone face 3. The feed 4 is conveyed to the feeding pan from an overlying horizontal transport channel 5, in which the feed is transported in a direction of transport indicated by the arrow 6 and forwardly to successive feeding pans 1 along the transport channel 5. The feed 4 is conveyed to an external side 8 of a  
25 distribution cone 7 in the feeding pan, passing out through a passage for initial

feeding 9 in the transport channel 5. This is illustrated in Fig. 3 and Fig. 4, where the feeding pan is shown with initial feeding terminated with feed distributed in the pan along the entire rim, and a certain amount of feed on the floor. Alternatively, the feed 4 is conveyed out of the transport channel through a passage for regular feeding 10, as will be seen in Fig. 7. Here, the feed 4 passes on through an opening 11 in the top of the distribution cone 7 to the inner side of the distribution cone 7. As will be seen from Fig. 2, the feed 4 in the transport channel 5 must pass in the direction of transport 6 past the passage for initial feeding 9, before it reaches the passage for regular feeding 10 down through the opening 11. In the transport channel 5, the feed 4 has a speed of movement when the screw line-shaped auger 12 rotates, and, when moving out of the passage for initial feeding 9, the feed will thereby have a horizontal speed component and a vertical speed component. The horizontal speed component imparts an impulse to the feed in the direction of the arrow 6, and, according to the invention, this impulse is used for improved spreading of the feed on the outer side 8 of the distribution cone 7.

The transport channel 5 may be rotated about its longitudinal axis relative to the feeding pans 1 which are connected to it. In an angular position  $v_2$  shown in Fig. 16, the passage for initial feeding 9 will be open toward the external side 8 of the distribution cone, and at the same time the passage for regular feeding 10 will be closed. This will also be seen in Fig. 3 and Fig. 4. If the transport channel is rotated to another angular position  $v_1$ , shown in Fig. 15, relative to the feeding pans, the passage for regular feeding 10 is opened down to the opening 11 at the top of the distribution cone 7, and the passage for initial feeding 9 is closed. This is also illustrated in Fig. 7. The rotation of the transport channel takes place via a handle, which is shown in Figs. 17 – 20, and which is connected with the pipe 13 of the transport channel and is arranged e.g. at the termination of a feeding system e.g. at the end wall of the farmhouse.

The vector speed component of the feed in the longitudinal direction 6 of the transport channel 5 corresponding to a feed speed and the speed component corresponding to free fall mean that the feed is received on chute faces 14, 15 externally on the distribution cone 7 and is distributed by skidding along the chute faces 14, 15 to the periphery of the feeding pan. The chute faces 14, 15 are defined by upright stop faces 16, 17 which merge into an upright dividing line 18. The horizontal speed component of the feed out of the initial feeding opening 9 means that the feed 4 impinges on the dividing line 18 and then continues along its respective chute face 14, 15. The purpose of this is that as great a part of the circumference of the feeding pan as possible is hit by the feed at the initial feeding. When the feeding pan has been filled all the way round its periphery, continued supply of feed 4 will mean that the feed 4 continues beyond the edge 2 and lands on the farmhouse floor, as will be seen in Fig. 3. Here, chicks or other small poultry walk about and are inclined by nature to search feed on the surface on which they walk. At the same time, the newly hatched poultry may be so small that it is not able to pick up feed from the feeding pan 1 within the rim 2 thereof, so that initial feeding directly on the floor is a prerequisite for the survival of the animals during the first days in the farmhouse. The poultry, however, grows so strongly that within a few days it has a size that allows it to reach the feed directly from the pan, and from then on feeding takes place as normal feeding, where the feed is conveyed through the opening at the top of the distribution cone and is spread to the rim area via the internal incorporated cone face of the pan.

The skid or chute faces 14, 15 and the stop faces 16, 17 must be arranged such that the feed 4 is distributed to as great a part of the periphery of the pan 1 as possible. It will be seen from Fig. 6 that 12 radially extending hampering plates 19 are provided at the bottom of the skirt of the distribution cone, the purpose of which is to hamper the poultry so that the animals do not use the pan 1 as a nest and resting place, resulting in non-access to the feed 4 for the other animals and

pollution of the feed 4. It is desired that at least 6 out of 12 gaps between the hampering plates are filled with feed, or 6 twelfths of the periphery of the pan are filled. However, it is preferred that at least 8 twelfths or at least 11 twelfths of the periphery of the feeding pan receive feed, which is distributed along the chute  
5 faces 14, 15. The feed will accumulate along a portion of the rim 2, typically 3 twelfths of the rim, as will be seen in Fig. 4, until it runs out on the surrounding floor where it forms a pile, and only when this pile from the initial feeding opening in the pipe cannot receive more feed, is the initial feeding completed. Thus, the feed 4 is added until accumulation on the chute faces 14, 15 stops the supply, and the feed  
10 will then continue the transport forwards to the next feeding pan 1 arranged on the pipe 13 of the transport channel.

Then, the feed will cover the farmhouse floor outside the periphery of the feeding pan along the stated part thereof, while the inner rim of the pan is covered with  
15 feed as far as possible all the way round.

Thus, the feeding pan 1 of the feeding system comprises the outer distribution cone 7, which, with its skirt, fits into the feeding pan within and below the upper edge 20 of the raised rim 2 of the pan, so that feed 4, which is fed through the  
20 opening 11 of the distribution cone at the top thereof and is fed to its inner sides, will not flow over the edge 20 at any time. The chutes 14, 15 pass on their respective sides of the top of the distribution cone and the opening 11 therein, and their extent begins at an additional dividing line 38 disposed just below the passage for the initial feeding 9 and in continuation of the upright dividing line 18.  
25 The chutes 14, 15 are inclined with a skid angle suitable for the feed toward the bottom of the feeding pan, and comprises at least 3 twelfths of the circumference, preferably not less than 9 twelfths of the circumference of the distribution cone 7. This ensures that practically all parts of the rim 2 of the feeding pan are coated with

feed 4 on its internal side. The 12 hampering plates 19 are equidistantly spaced and are of the same shape, 2 of them having a depressed upper rim 19.1, which may be instrumental in causing a larger area of the feeding pan rim to be coated with feed 4 during the initial feeding. A rim section between two hampering plates 19 then corresponds to 30 degrees of the total circumference of 360 degrees. 2  
5 twelfths are the same as 60 degrees, 3 twelfths are the same as 90 degrees, and thus the relation between twelfths and degrees continues.

If the transport channel 5 is allowed to be disposed at an arbitrary height above the  
10 bottom of the feeding pan, the task of ensuring a suitable skid angle for the chute faces 14, 15 in order to fill the feeding pan along and outside the entire rim 2, is a trivial problem, but at the same time a relatively low overall mounting height is desired, so that the farmer can relatively easily move about in the farmhouse irrespective of the many transport channels 5 and associated pipes 13.

15

A screen element 21 for screening the passage 9 for the initial feeding is provided above the extent of the chutes 14, 15 at the top of the distribution cone. The screen element is seen best in Fig. 5, Fig. 8 and Fig. 9. The screen element 21 has a detachable attachment 22 for the pipe 13 of the transport channel 5. The  
20 attachment 22 comprises a slitted pipe 23 with an internal diameter essentially corresponding to the external diameter of the pipe 13 of the transport channel. The slit 24, which extends in the entire length of the slitted pipe 23, allows the slitted pipe 23 to be snapped around the pipe 13 of the transport channel, so that it fits tightly against the surface thereof. The slitted pipe 23 will have a wide slit in a  
25 central area of the attachment 22, so that the feed may pass therethrough and down into the opening 11, or down on the outer chute faces 15, 14 of the distribution cone. The screen element 21 extends downwards from the area around

the wide slit, so that it is not possible to get a finger into the passage 9 for the initial feeding.

At downwardly facing edge parts along the slit 24, opposite the screen element 21,  
5 the slitted pipe 23 has gripping grooves 25 which cooperate with shape-complementary grooves 26 in the upper part of the distribution cone along the opening 11. The gripping grooves 25 may be slid into the shape-complementary grooves 26 in the distribution cone so as to form a tight-fitting attachment between the two parts. When the distribution cone 7 is slid into position and receives the  
10 grooves 25, this takes place by a mutual movement between distribution cone 7 and screen element 21 in parallel with the pipe 13. With the attachment 22 snapped around the pipe 13, the slit 24 will hereby be locked, so that the attachment 22 cannot be removed from the pipe 13 again once the distribution cone 7 has been mounted on it. This method of assembly is both simple and  
15 straightforward and can be made without the use of tools.

Further, around its terminating rim at the gripping grooves 25, the slitted pipe 23 of the screen element 21 has an outwardly directed flange 27, which serves as a detachable attachment for a locking ring 28, shown in Figs. 10 and 11. The locking  
20 ring 28 comprises a hook 29 which grips the flange 27 when the locking ring 28 is mounted in addition to the total system comprising the screen element 21 and the distribution cone 7. As the hook 29 grips the flange 27, it may be ensured that the locking ring 28 and the slitted pipe 23 cannot be displaced axially relative to each other, but may still be rotated relative to each other about their common  
25 longitudinal axis. The locking ring 28 moreover comprises an inwardly directed boss 30 which forms a shape-complementary fit with a recess or locking opening 31 in the pipe 13 of the transport channel. When the boss 30 is placed in the locking opening 31, the pipe 13 and the locking ring 28 will be fixed relative to each

other, both in the axial direction and in terms of rotation. The boss 30 and the locking opening 31 are asymmetrical, so that the locking ring can only be mounted with the boss 30 in the locking opening 31 when the locking ring 28 is oriented correctly relative to the direction of transport 6. This ensures that the distribution  
5 cone 7 and the attachment 22 will always be seated correctly relative to the initial feeding and regular feeding openings of the pipe 13.

The locking ring 28 additionally has a radial engagement face 32 adapted to cooperate with a radially extending projection 33, shown in Fig. 13, on the upper  
10 part of the distribution cone 7, so that the locking ring 28 does not affect the distribution cone 7 by rotation of the transport channel 5 in an angular interval. Such angular positions are shown in Figs. 15 and 16 and indicated by V1 and V2.

Figs. 17 to 20 show part of a feed line in a 3d representation, where a plurality of  
15 feeding pans is shown in succession on a feed pipe. The angular intervals are illustrated in Fig. 17 and Fig. 18, where Fig. 17 shows the handle 39 and thereby the pipe in an angular position like the angular position shown in Fig. 15 corresponding to the setting of the system for normal feeding, and where Fig. 18 shows the handle and the angular rotation of the pipe like in Fig. 16, which  
20 corresponds to a setting of the system for initial feeding. In these angular positions, it will be seen that the pipe is rotated without the feeding pan being rotated as well. Fig. 19 shows an angular position of the pipe and the handle corresponding to the angular position shown in Fig. 14, and, finally, further rotation of the handle and the pipe is shown in Fig. 20. With this rotation of the transport channel 5 in the  
25 additional angular interval, the engagement face 32 of the locking ring will engage the radial projection 33 of the distribution cone, and the rotation of the pipe 13 of the distribution channel causes the distribution cone 7 and the rest of the feeding pan 1 to be rotated too. Hereby, it is possible to rotate all the feeding pans

mounted on the pipe of a transport channel 5 to a position in which they are easy to clean, e.g. with the bottom of the pan 1 in a vertical position up from the farmhouse floor, as will be seen in Fig. 20. With this rotation of the pipe relative to the feeding pan, both openings out of the pipe will be blocked, and this also means  
5 that flushing of the feeding pan with water under pressure may be performed without water penetrating into the pipe, thereby protecting the internal area of the pipe from being soiled during the cleaning of the feeding pans.

The locking ring 28 is initially open, as shown in Fig. 10 and Fig. 11. The ring 28 is  
10 made of a flexible material, so that it may be opened even more, as a lower locking tongue 40 may be pressed away from an upper locking tongue 41, so that the ring 28 is mountable on the pipe 13. The locking tongues 40, 41 have shape-complementary barbs 42, so that the locking tongues 40, 41 will cause the barbs to lockingly engage each other when the opening of the ring is pressed together. This  
15 may be done without tools.

The distribution cone 7 is detachably connected with the feeding pan 1 through flexible stays 34 (see Fig. 2), which extend downwards from the internal side of the top of the feed cone around the opening 11 therein, as will be seen e.g. in Fig. 2.  
20 At the bottom, the flexible stays 34 are provided with spearhead-shaped barbs 35, which are adapted for snap engagement with a rim area of a through opening 36 in a central area of the cone face 3 of the feeding pan 1. When the distribution cone 7 and the pan 1 are to be separated, this is relatively easy to do by pressing the spearhead-shaped barbs 35 radially together, which may easily be done with a  
25 suitable tool, which may e.g. consist of a pipe (not shown) with an internal conical rim at its one end. This method of separation and assembly is not destructive and may be carried out many times without causing any damage or noticeable wear to the parts, which contributes to ensuring long life and great flexibility of the system.

The central area of the feeding pan 1 is shaped as a cone face 3 and is thus raised above its rim 2, thereby creating an annular, fillable feed store 37 between the cone shape of the central area and the distribution cone 7, which will automatically be emptied out toward the rim 2 of the feeding pan when the animals eat from the feed there.

Fig. 2 and Fig. 12 show a pipe 13 for use as a transport channel 5 in a feeding system. The pipe 13 accommodates a screw line-shaped member 12 which, upon rotation, causes the feed to be fed forwards in the pipe 13, said pipe having a radial opening 9 for feed passage out of the pipe for initial feeding, there being subsequently in the direction of transport 6 a radial opening 10 for feed passage out of the pipe 13 for regular feeding. The pipe 13 may have any length corresponding to e.g. the length of a farmhouse system, and the pipe may additionally be composed of suitable lengths, as is well-known for long pipe members. The screw line-shaped member or auger or worm is also a well-known element and is here made of an elongate piece of flat iron. At an end of the pipe, there is provided a motor, e.g. an electric motor, which imparts a rotational movement to the auger, which movement will propagate to the entire auger in the entire length of the pipe. Hereby, the feed may be transported all the way and drop down into feeding pans, where they are mounted on the pipe.

The two openings 9, 10 are arranged at an axial distance from each other in the longitudinal direction of the pipe, and they are moreover positioned at a mutual angle of rotation in the circumference of the pipe relative to each other, the shortest angle of rotation from the regular feeding opening to the initial feeding opening being opposite the direction of rotation of the screw line-shaped member in the pipe, when it is rotated for propulsion of the feed. This ensures that the feed in the pipe does not accumulate against the passage 9 for the initial feeding, when this is

not in use. It is also well-known that openings of the type required for creating a passage for the feed will weaken the pipe, and therefore it is necessary to have a certain distance between them.

## Reference numerals:

	1	Feeding pan
	2	Annular rim
	3	Cone face
5	4	Feed
	5	Overlying transport channel
	6	Direction of transport
	7	Distribution cone
	8	External face of distribution cone
10	9	Passage for initial feeding
	10	Passage for regular feeding
	11	Opening in distribution cone top
	12	Screw line-shaped member
	13	Transport channel pipe
15	14	Chute face
	15	Chute face
	16	Stop face
	17	Stop face
	18	Upright dividing line
20	19	Hampering faces
	20	Upper edge
	21	Screen element
	22	Attachment for pipe
	23	Slitted pipe

	24	Slit
	25	Gripping grooves
	26	Shape-complementary grooves
	27	Flange
5	28	Locking ring
	29	Hook
	30	Boss
	31	Locking opening
	32	Radial engagement face
10	33	Radially extending projection
	34	Flexible stays
	35	Barbs
	36	Opening
	37	Fillable feed store
15	38	Additional dividing line
	39	Handle
	40	Lower locking tongue
	41	Upper locking tongue
	42	Barbs

**PATENT CLAIMS**

1. A method of filling feeding pans (1) for poultry or other freely moving small animals, wherein the feed (4) is conveyed to a feeding pan (1) from an  
5 overlying horizontal transport channel (5), in which the feed (4) is transported in a direction of transport (6) and forwardly to one of several successive feeding pans (1) along the transport channel, wherein the feed (4) is conveyed either to an external side of a distribution cone (7) in the feeding pan (1), out through a passage for initial feeding (9) in the transport channel (5), or,  
10 alternatively, is conveyed out through a passage for regular feeding (10) in the transport channel and through an opening (11) in the top of the distribution cone (7) to the inner side of the distribution cone (7), **characterized in** that the feed (4) in the transport channel (5) in the direction of transport (6) passes past the passage for initial feeding (9), before it reaches the passage for regular  
15 feeding (10), so that the feed (4) passes out through the passage for initial feeding (9) with a speed component in the longitudinal direction of the transport channel corresponding to a feed speed of the feed (4) in the transport channel (5) and a speed component corresponding to free fall, as it is received by an upright dividing line, and, because of the speed component in the longitudinal  
20 direction of the transport channel, is sent in separate flows of material along chute faces (14, 15) on the external face (8) of the distribution cone and is distributed by skidding along respective chute faces (14, 15) to the periphery of the feeding pan.
- 25 2. A method according to claim 1, **characterized in** that the feed is distributed along the chute faces (14, 15) until the feed (4) covers part of the farmhouse floor outside the periphery of the feeding pan (1) along a portion of the periphery, so that the farmhouse floor is covered with feed along at least 6

twelfths of the periphery of the feeding pan, or preferably at least 8 twelfths, or at least 11 twelfths of the periphery of the feeding pan are covered with feed.

3. A method according to claim 2, **characterized in** that the feed is divided into two flows of material by an additional dividing line (38) disposed in continuation of the upright dividing line (18) between two chute faces (14, 15).  
5
4. A method according to claim 3, **characterized in** that at least part of the dividing lines (18, 38) is disposed below the passage for initial feeding (9).  
10
5. A feeding system for freely moving poultry or other small animals, comprising a feeding pan (1), which has an outer distribution cone (7) with a central raised part and an opening (11) in the central raised part as well as a skirt, which fits into the feeding pan (1) within and below the upper edge of a raised rim (2) associated with the feeding pan, and wherein an overlying horizontal transport channel for feed is provided above the distribution cone, a passage for regular  
15 feeding (10) out of the transport channel (5) being provided such that the feed, when passing therethrough, passes through the opening (11) at the top of the distribution cone (7) to the inner side of the distribution cone, **characterized in** that, prior to the passage for regular feeding (10) in the direction of movement  
20 of the feed, there is a passage for initial feeding (9) out of the transport channel (5), arranged such that the feed passes out of the initial feeding passage and impinges on separate chute faces (14, 15) on the external face (8) of the distribution cone, an upright dividing line (18, 38) between the two chutes being  
25 present in the distribution cone.

6. A feeding system according to claim 5, **characterized in** that the chute faces (14, 15) are inclined from the upper part of the distribution cone from the upright dividing line (18, 38) and down toward the rim (2) of the feeding pan (1), said inclined chute faces (14, 15) comprising at least 3 twelfths of the circumference, preferably not less than 9 twelfths of the total circumference of the distribution cone.
7. A feeding system according to claim 6, **characterized in** that a screen element (21) for screening the passage for the initial feeding (9) is provided above the extent of the chute faces (14, 15) at the upper part of the distribution cone, said screen element (21) additionally comprising a detachable attachment (23, 24) for the pipe (13) of the transport channel, an attachment (25) for the distribution cone (7) as well as a detachable attachment (27) for a locking ring (28) fixed against rotation relative to the transport channel.
8. A feeding system according to claim 7, **characterized in** that the locking ring (28) is in rotatable engagement with the screen element (21), but axially fixed relative to it, and that the locking ring (28) additionally comprises a radial engagement face (32) cooperating with a radially extending projection (33) on the upper part of the distribution cone (7), so that the locking ring (28) does not affect the distribution cone (7) upon rotation of the pipe (13) of the transport channel in an angular interval, and so that upon rotation of the pipe (13) of the transport channel in a further angular interval the locking ring (28) will carry the distribution cone along in the rotation at the engagement of the radial engagement face (32) with the radially extending projection (33) on the distribution cone (7).

9. A feeding system according to claim 8, **characterized in** that the distribution cone (7) is detachably connected with the feeding pan (1) through flexible stays (34) extending downwards from the internal side of the top of the feed cone around the opening (11) in it, said flexible stays (34) being downwardly provided with spearhead-shaped barbs (35) adapted for snap engagement with a rim area of a through opening (36) in an arched central area of the feeding pan (1) shaped as a cone face (3).
10. A feeding system according to claim 9, **characterized in** that the central area of the feeding pan is raised above its rim so as to create an annular fillable feed store (37) between the cone face (3) of the central area and the distribution cone (7), said feed store being automatically emptied out toward the rim (2) of the feeding pan when the animals eat from the feed there, said spearhead-shaped barbs (35) being flexible in the radial direction so that the feeding pan (1) is easily removable when the stays (34) are affected in the radial direction.
11. A feeding system according to claim 8, **characterized in** that the transport channel comprises a pipe (13) having a radial passage for feed out of the pipe (13) for initial feeding (9) and subsequently in the direction of transport (6) a radial passage for feed out of the pipe for regular feeding (10), said pipe blocking the access from the feeding pan to the two radial passages (9, 10) upon its rotation relative to the feeding pan forwards toward the further angular interval.

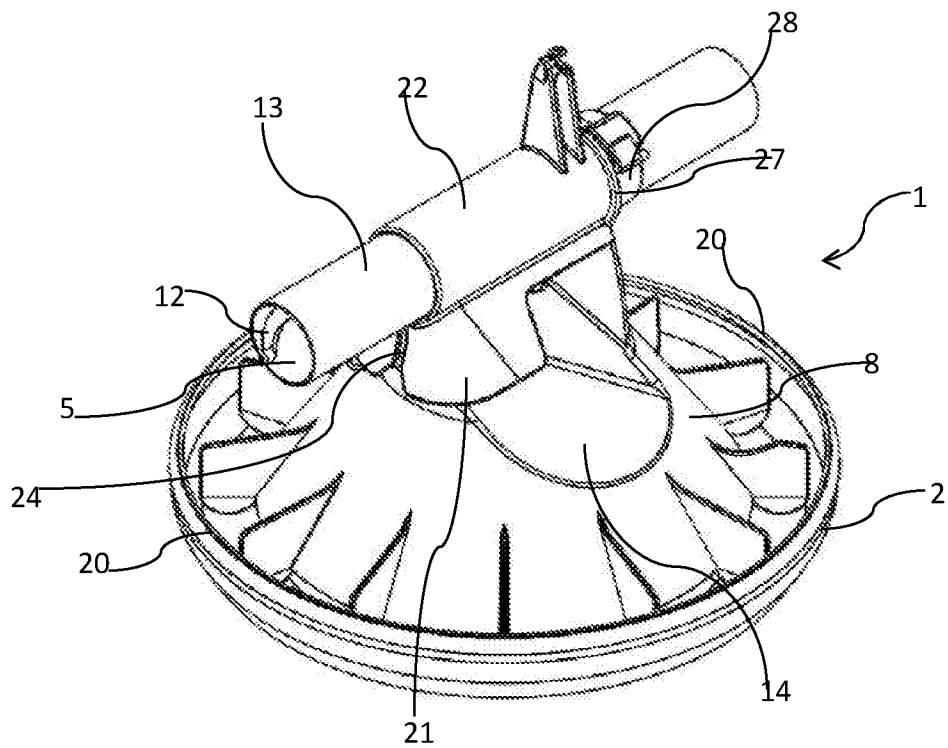


Fig. 1

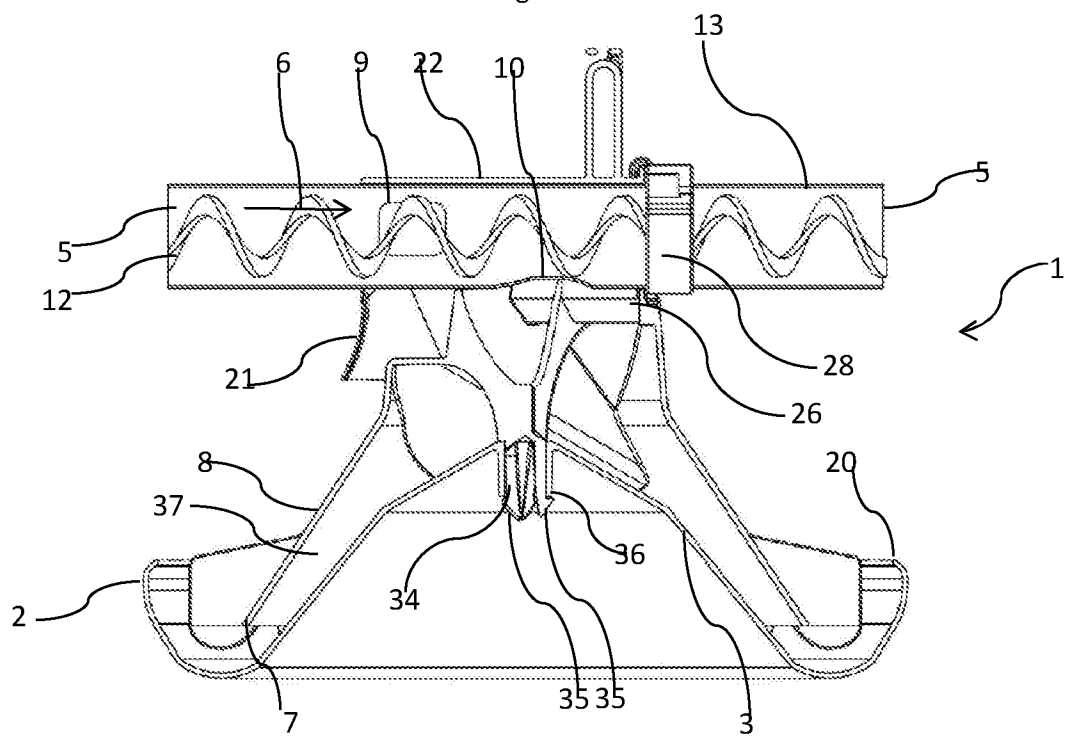


Fig. 2

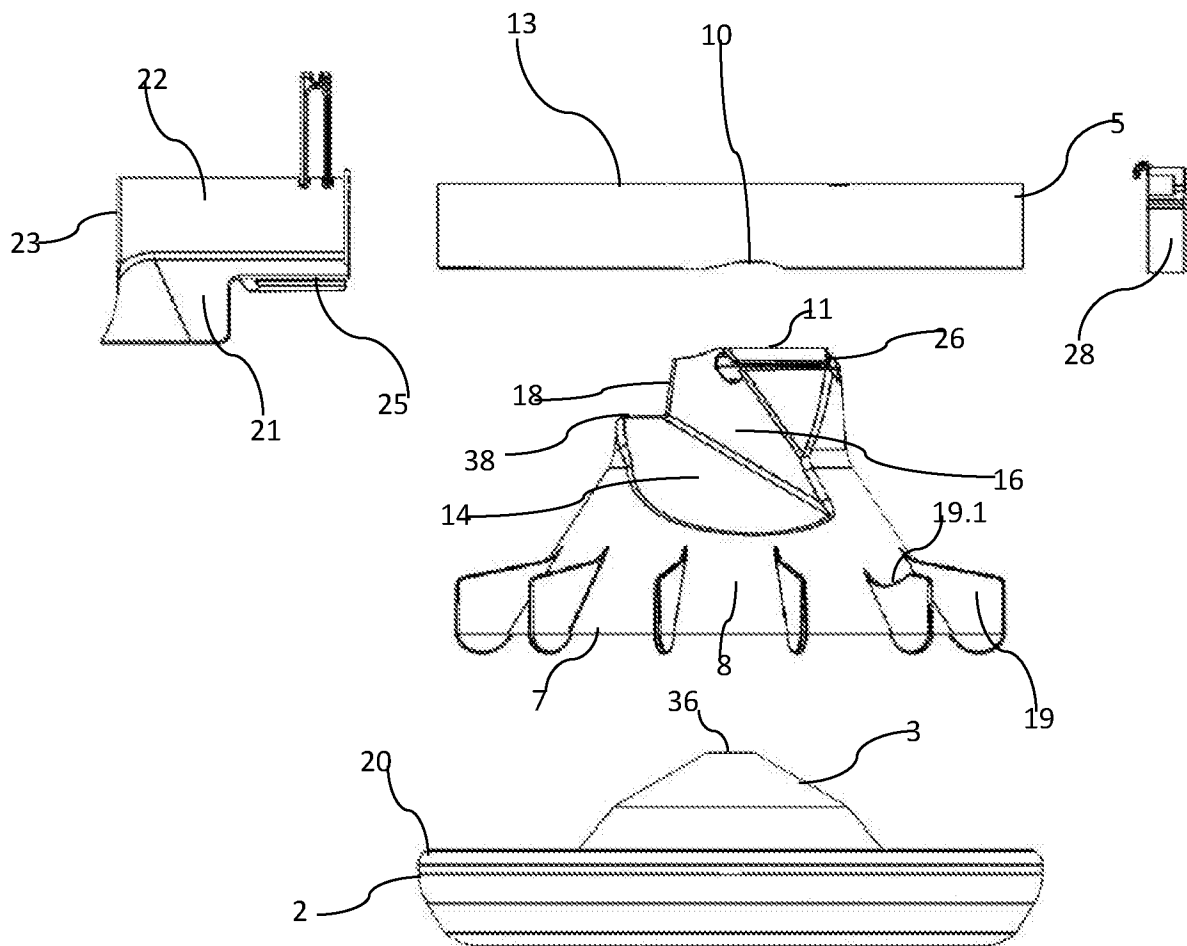
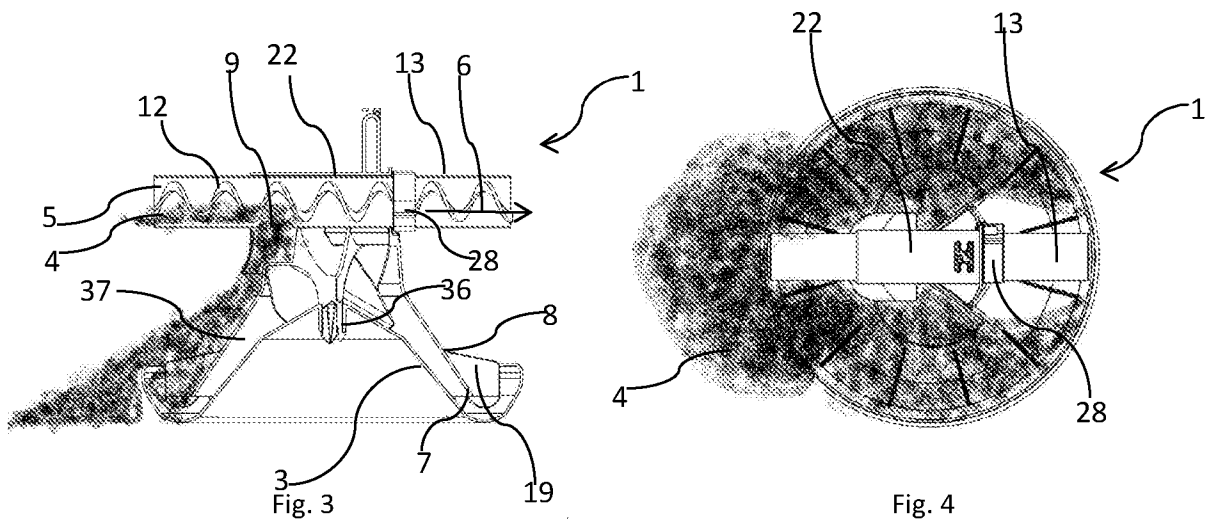


Fig. 5

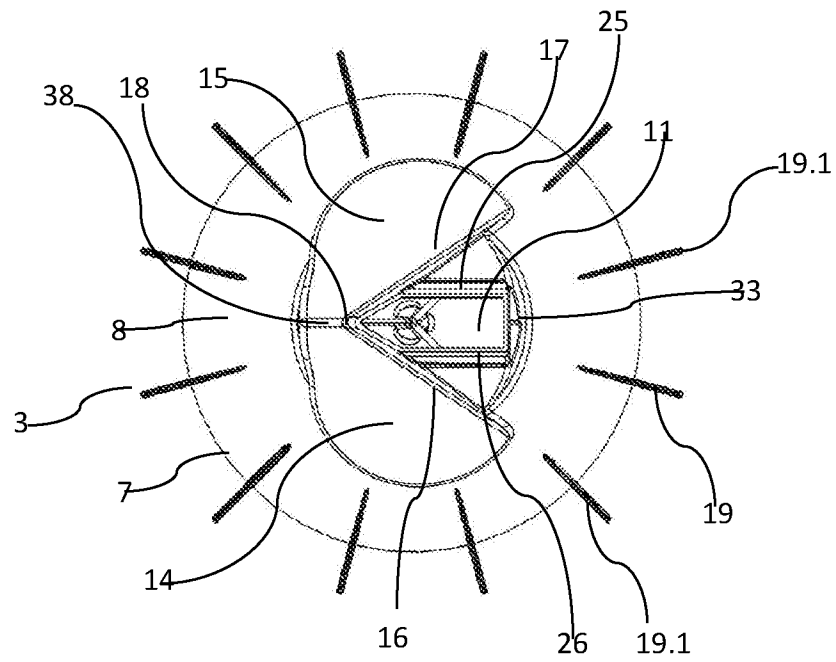


Fig. 6

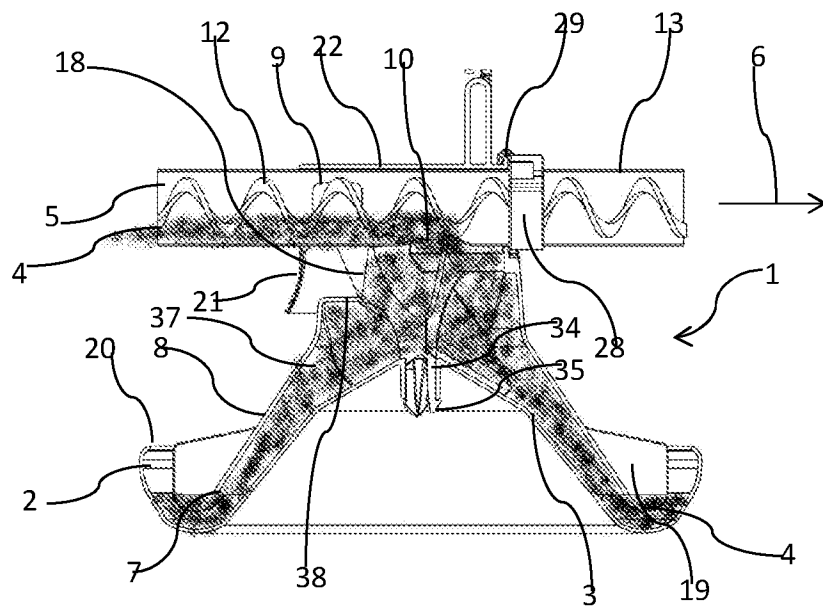
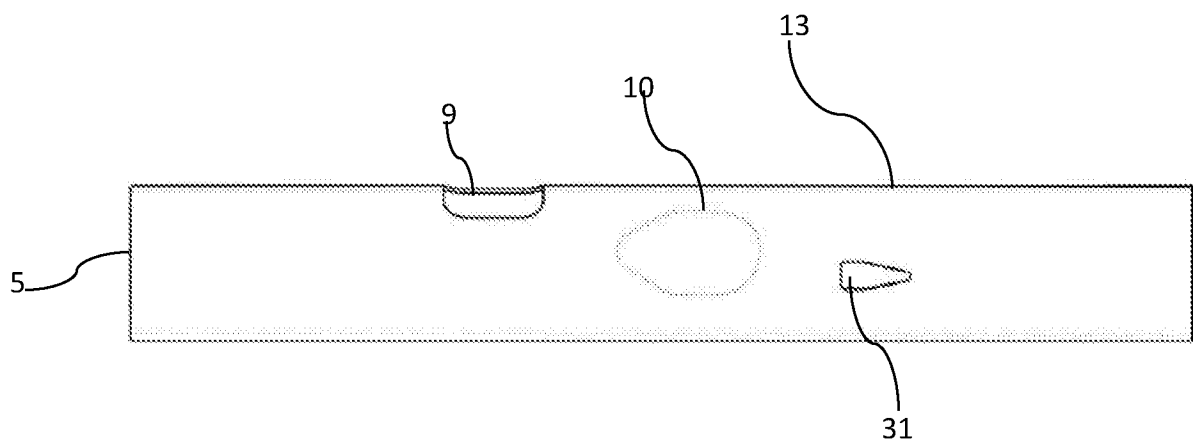
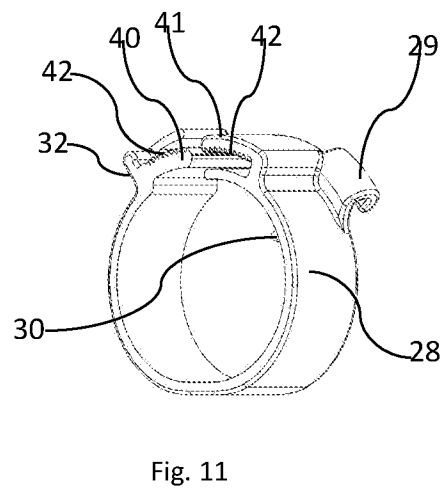
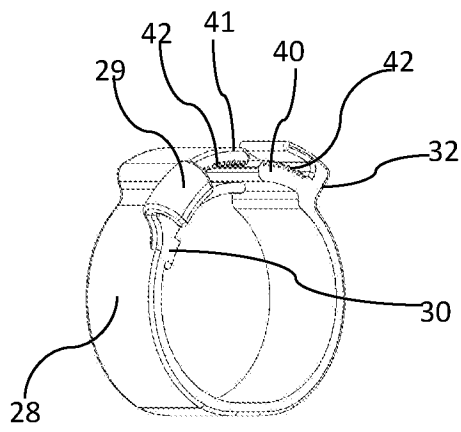
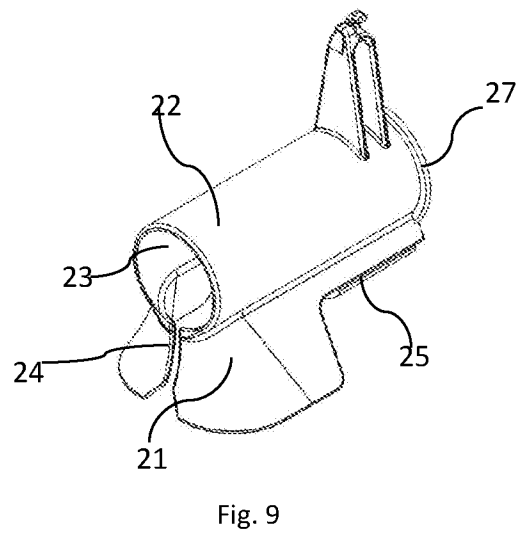
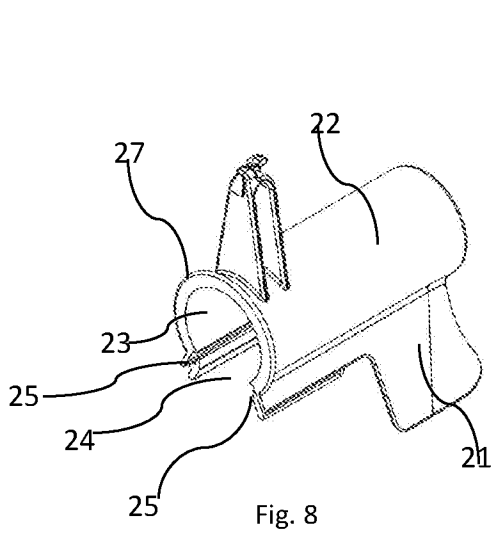


Fig. 7



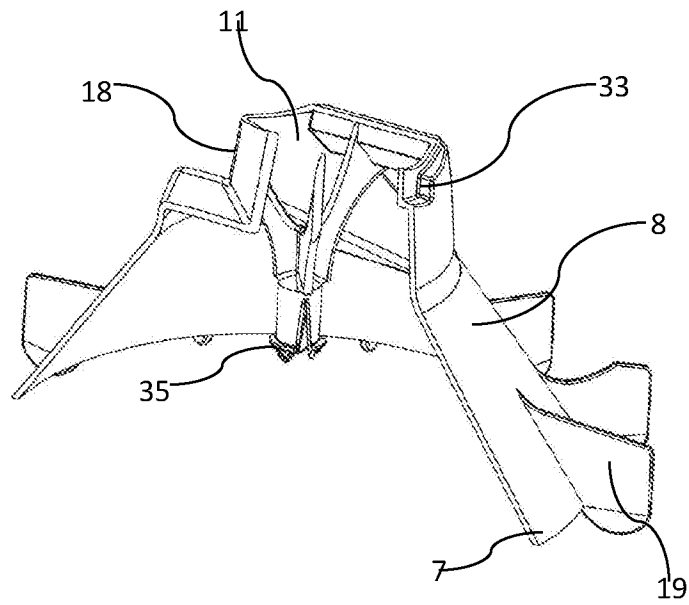


Fig. 13

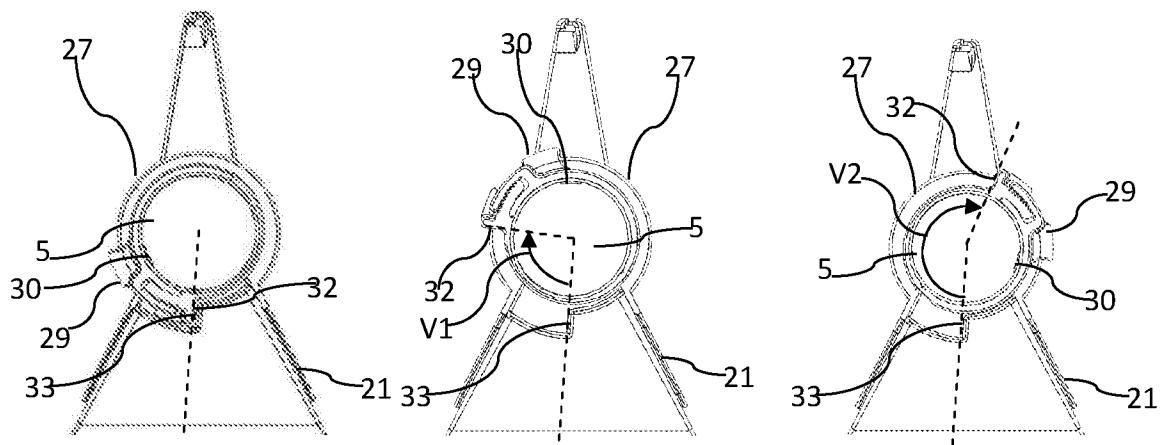


Fig. 14

Fig. 15

Fig. 16

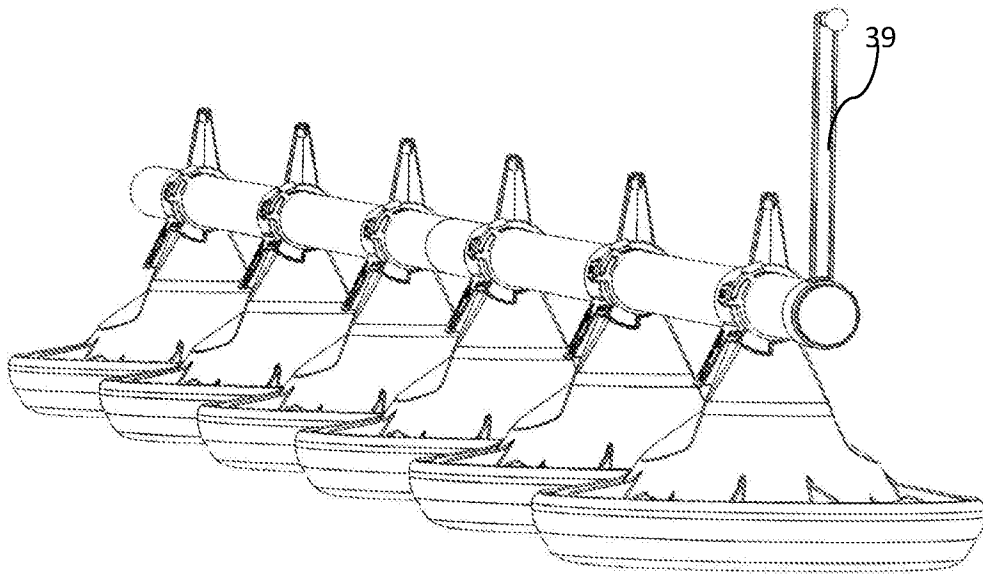


Fig. 17

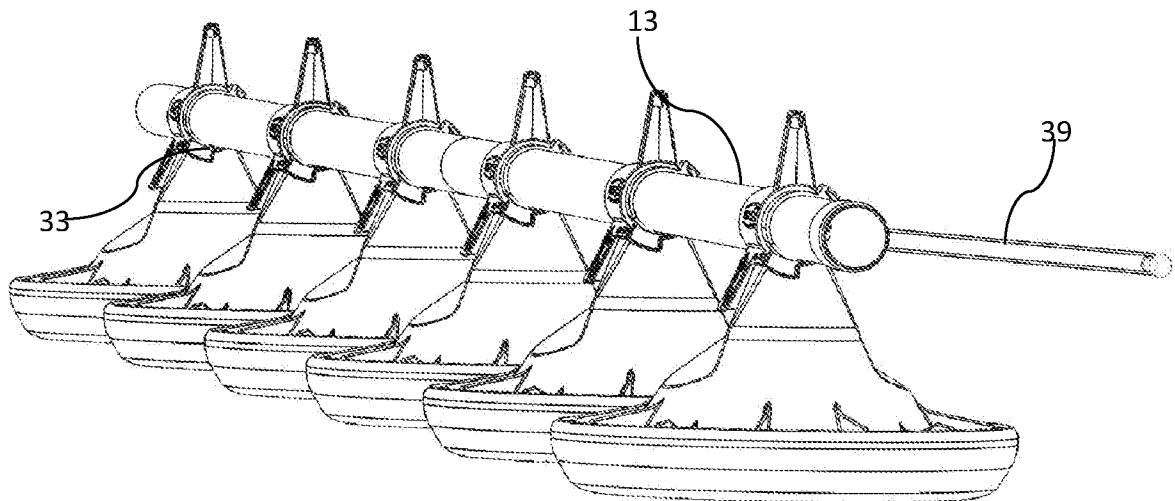


Fig. 18

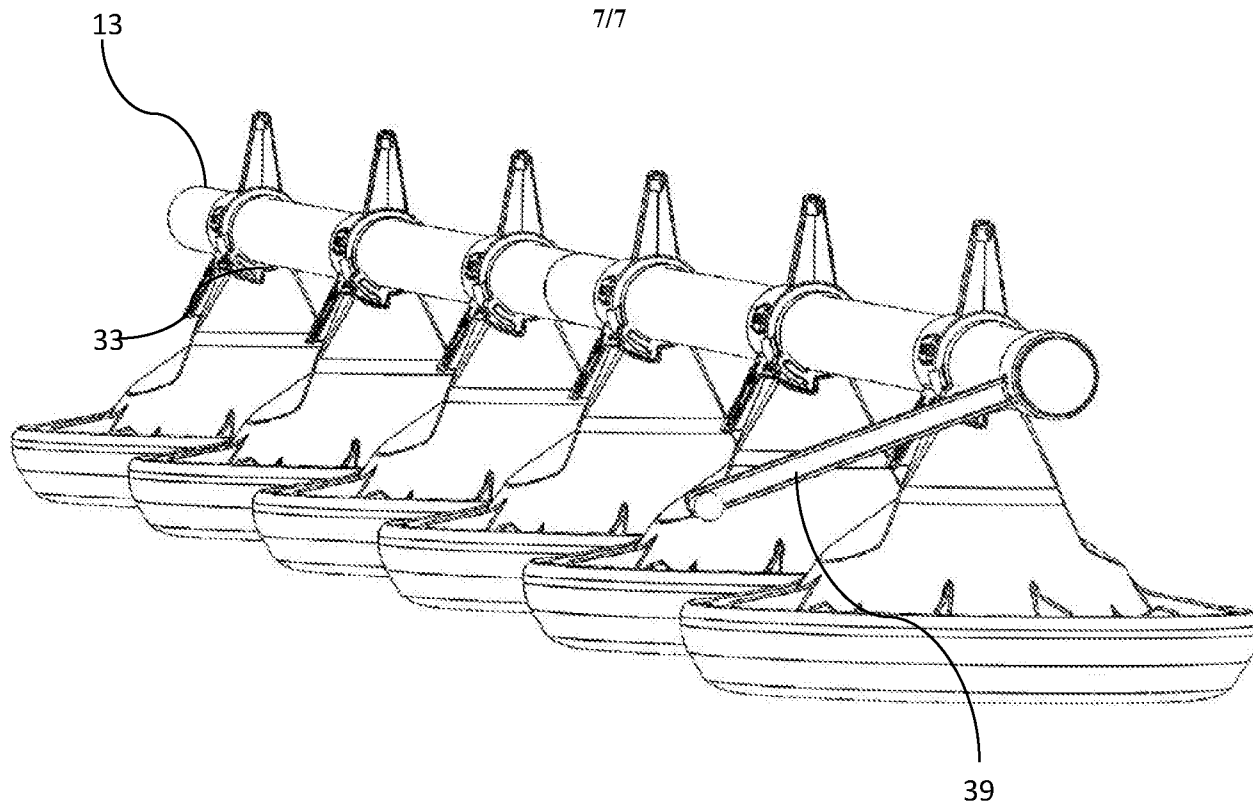


Fig. 19

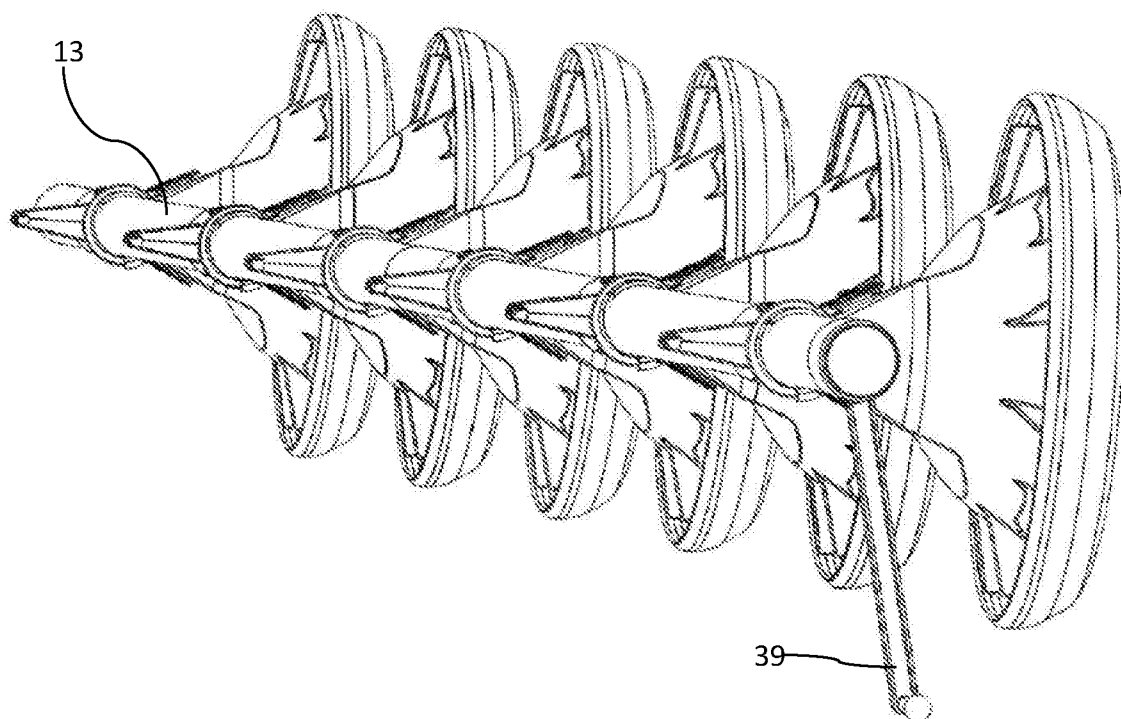


Fig. 20

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/DK2017/050120

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> A01K 39/012 (2006.01), A01K 5/02 (2006.01) According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) IPC & CPC: A01K		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched DK, NO, SE, FI: Class A01K39/012.		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPODOC, WPI, FULL TEXT: ENGLISH		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A, D	DK 2000 00242 U3 (LANDMECO, ØLGOD A/S) 23 November 2001, see whole document.	1 – 11
A	US 5927232 A1 (POLLOCK) 27 July 1999, see abstract and figures.	1 – 11
A	US 5794562 A1 (HART) 18 August 1998, see column 5, line 4 – 43 and figure 11 – 13.	1 – 11
A	EP 0378039 A1 (TECNICA E INNOVATIONES GANADERAS, S.A.) 18 July 1990, see abstract and figures.	1 – 11
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
* Special categories of cited documents: “A” document defining the general state of the art which is not considered to be of particular relevance “E” earlier application or patent but published on or after the international filing date “L” document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) “O” document referring to an oral disclosure, use, exhibition or other means “P” document published prior to the international filing date but later than the priority date claimed “T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention “X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone “Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art “&” document member of the same patent family		
Date of the actual completion of the international search 27/06/2017		Date of mailing of the international search report 03/07/2017
Name and mailing address of the ISA Nordic Patent Institute Helgeshøj Allé 81 DK - 2630 Taastrup, Denmark. Facsimile No. + 45 43 50 80 08		Authorized officer Anni Møller Telephone No. +45 43 50 81 31

# INTERNATIONAL SEARCH REPORT

## Information on patent family members

International application No.

PCT/DK2017/050120

Patent document cited in search report / Publication date		Patent family member(s) / Publication date	
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