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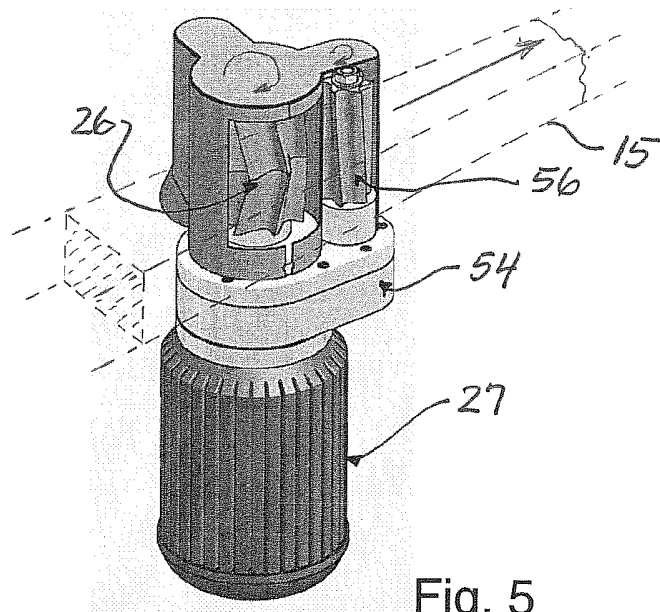
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(57) Sammendrag:
An apparatus for processing fur, particularly mink fur, the apparatus having an elongated mandrel (15) for supporting a pelt (25) mounted thereon with the flesh side facing outwards, scraper rollers (26, 31) with scraper edges (49), cylinder means (30, 35) adapted for pressing the scraper edges (49) of the scraper rollers (26, 31) for bearing against the flesh side of the pelt mounted on the mandrel (15), and actuating means (14) for moving the mandrel (15) and the scraper rollers (26, 31) relative to each other in longitudinal direction of the mandrel, the scraper edges (49) on the scraper rollers (26, 31) together forming a contour which is substantially complementary to the contour of the cross-section of the mandrel (15), where the two scraper rollers (26) adapted to process the pelt at vertical sides of the mandrel (15) are each driven by an electric motor (27) which via a gearing (54) simultaneously drives a secondary scraper roller (56) which is arranged to be pressed against partial vertical parts of the flesh side of the pelt (25) mounted on the mandrel (15). Hereby is achieved a significantly technical simplification of the apparatus and a functionally improved clean scraping of fur.

Fortsættes ...



APPARATUS FOR PROCESSING FUR

Field of the Invention

The present invention concerns an apparatus for processing fur, particularly mink fur, and of the kind specified in the preamble of claim 1.

Background of the Invention

5 A pelt pulled off a fur animal normally has a layer or remains of fat and/or flesh adhering to the flesh side of the pelt. Such layers or remains are to be removed before the pelt can be further processed. The present invention concerns an apparatus for removing such unwanted residue of fat and/or flesh from the inner side of the pelt of a fur animal.

10 DK 113795 C discloses an apparatus of the mentioned kind, having a conical mandrel which is rotatably suspended at both ends such that it can be rotated about its longitudinal axis. A pelt to be processed is put on the mandrel with the inner side facing outwards. A scraping device, which is a single roller made of an elastically yielding rubber material and the axis of which extending transversely to the axis of the mandrel, is brought to rotate
15 about its axis simultaneously with the roller being pressed to bear against the pelt and moved along the mandrel. On its circumferential surface, the roller is designed with peripherally interspaced rectilinear scraper edges extending in parallel with the roller axis. Remains of fat and flesh can be scraped off a narrow longitudinal zone on the pelt in that the rotating roller is manually moved back and forth along the mandrel, and from time to
20 time the mandrel is turned a certain angle so that a second longitudinal zone on the pelt is subjected to the scraping process.

DK 156669 B3 discloses a method and an apparatus for removing fat and flesh from the flesh side of the pelt of a fur animal, and a roller for use in such an apparatus. The
25 present description includes a description of the prior art in this document, at the same time referring to Figs. 1-4 which also show this prior art apparatus.

DK 176494 B1 discloses an apparatus for processing fur, including a number of scraping mandrels and at least one motor-driven scraping roller, where the fur is placed
30 on the mandrel with an inner side facing outwards, where the apparatus includes a motor system with a number of fixing means adapted for holding a lower end part of

the mandrel which is preferably disposed in an upright position relative to the fixing means, the motor system adapted for moving the mandrels past a number of processing positions.

5 EP 2 093 299 A1 describes an apparatus for fur processing, performing automated removal of flesh and fat from the fur side of a pelt, the apparatus including an oblong conical mandrel on which the pelt is drawn with the fur side inwards and with the head end of the pelt at the thinner end of the mandrel, where the pelt is scraped with a roller scraper unit having a secondary scraper roller adapted to transmit a tangential friction
10 force to the pelt on the mandrel in direction against the thinner end of the mandrel. Hereby is achieved that the roller scraper unit can perform both primary and secondary scraping, where primary scraping removes the immediately accessible flesh and fat from the fur side, and secondary scraping loosens flesh and fat located under the forelegs on the pelt.

15 **Object of the Invention**

On this background, it is the purpose of the invention to indicate a new and improved apparatus of the kind indicated in the introduction, and which enables significant technical simplification of the apparatus and functionally improved clean scraping of fur.

20 **Description of the Invention**

The apparatus according to the invention is peculiar in that the two scraper rollers adapted to process the pelt at vertical sides of the mandrel are each driven by an electric motor which via a gearing simultaneously drives a secondary scraper roller which is arranged to be pressed against partial vertical parts of the flesh side of the pelt
25 mounted on the mandrel. Hereby is achieved a significantly technical simplification of the apparatus and a functionally improved clean scraping of fur.

The apparatus according to the invention is suitably designed such that the gearing is arranged rotatable in such a way that the scraper roller only can be pressed against the pelt
30 at a vertical side of the mandrel.

Alternatively, the apparatus according to the invention may advantageously be designed such that the gearing is arranged rotatable in such a way that the scraper roller and the secondary scraper roller simultaneously can be pressed against the pelt at a vertical side of the mandrel.

5

In a further embodiment, the apparatus according to the invention may be designed such that the gearing is arranged rotatable in such a way that the secondary scraper roller only can be pressed against the pelt at a vertical side of the mandrel.

Description of the Drawing

10 The invention will now be explained with reference to the drawing in the following, on which:

Fig. 1 shows a perspective view of a prior art apparatus for processing mink pelts;

Fig. 2 shows a perspective view of part of the prior art apparatus, cf. Fig. 1, with a
15 mandrel on which is mounted a mink pelt;

Fig. 3 shows how the mink pelt is removed from the mandrel during its return stroke; and

Fig. 4 shows a perspective view of a scraper roller for the prior art apparatus;

Fig. 5 shows a perspective view of an embodiment of a scraper roller arrangement for an
20 apparatus according to the present invention;

Fig. 6 shows a perspective view of the scraper roller arrangement shown in Fig. 5, shown without screen and scraper rollers, respectively;

Fig. 7 shows a perspective view of a combined screen and fat suction arrangement;

Fig. 8 shows a view of an embodiment of an apparatus according to the invention;

25 Fig. 9 shows a view of a mandrel with associated scraper rollers according to the invention;

Fig. 10 shows a view of a mandrel and primary and secondary scraper rollers for an apparatus according to the invention;

Fig. 11 shows a view of scraper roller arrangement for an apparatus according to the
30 invention;

Fig. 12 shows a close-up view of primary and secondary scraper rollers for an apparatus according to the invention; and

Fig. 13 shows a further close-up view of scraper roller arrangement for an apparatus according to the invention.

Detailed Description of Embodiments of the Invention

The apparatus shown in Figs. 1-3 has a frame or stand 10 with two parallel, horizontally
 5 extending guide rods 11. Sleeve means 12 surrounding the guide rods 11 are mounted on a
 slide 13. The slide 13 is also connected with the piston in a pneumatic cylinder 14 which is
 mounted on the frame 10 extending in parallel with the guide rods 11 and which is of the
 type without piston rod. One end of a mandrel 15, which is preferably made of wood, is
 bolted to a fork-shaped part 16 provided at one end of a shaft 17 which is rotatably seated
 10 in a bearing housing 18 mounted on the slide 13. A collar 19 mounted on the shaft 17 inside
 the housing 18 has a projection 20 which is disposed between a pair of mutually spaced
 stopping cams 21 which are designed at the inner side of the bottom wall of the bearing
 housing 18, and which serve to limit the rotary movement of the shaft 17 and thereby also
 the mandrel 15 to a rather small angle. The mandrel 15 has an upper and a lower, largely
 15 triangular face 22 and two opposing, largely rectangular narrow side faces 23. Not only the
 upper and lower face 22 but also the side faces 23 are tapering in direction of the free end
 24 of the mandrel 15. The size and shape of the free end part of the mandrel 15 is to be
 adapted to the size and shape of the fur or pelts 25 to be processed.

20 A scraper device includes two pairs of rollers. Thus is provided a pair of mutually opposed
 vertical rollers 26 which are driven by electric motors 27 that each are mounted on a
 mounting plate 28 which is pivotably suspended about an axis of pivot 29. The mounting
 plates 28 can be pressed against each other by means of pneumatic cylinders 30.
 Correspondingly, the scraping device also includes a pair of mutually opposed, horizontal
 25 rollers 31 driven by electric motors 32, and these electric motors 32 are mounted on
 mounting plates 33 that may be pivoted relative to the frame 10 about horizontally disposed
 axes of pivot 34. Pneumatic cylinders 35 acting on the mounting plates 33 may press the
 horizontal rollers 31 in direction towards each other. Apart from the pivoting movements
 that may be performed by the plates 28 and 33, the scraping device, which includes the two
 30 pairs of rollers 26 and 31, is mounted stationarily relative to the frame 10. As best seen on
 Fig. 2, the vertical and horizontal roller pairs 26 and 31 are provided spaced apart in

longitudinal direction of the mandrel 15, as the vertical rollers 26 are provided closer to the slide 13 than the horizontal rollers 31.

5 The scraping device is surrounded by a housing or a screen 36 of which only a part is shown on Fig. 1. This housing 36 has an inlet opening 37 and an outlet opening 38, and these openings which are located opposite the mandrel 15 are at least partly covered by flexible screening means 39 surrounding the openings 37 and 38. Suction mouthpieces 40 connected with a vacuum source (not shown) through vacuum lines 41 are mounted below and in the vicinity of the two pairs 10 of rollers 26 and 31. The outlet opening 38 leads
10 through a sawdust chamber 42 to which a supply line 43 may feed sawdust or similar material.

The apparatus operates in the following way: When the mandrel 15 is located in the retracted position shown in Fig. 1, a pelt 25 is put on the free end part of the mandrel with
15 its inner side or flesh side facing outwards. The function of the apparatus is initiated by pressing a button on a control panel 44, making the pneumatic cylinder 14 move the slide 13 and mandrel 15 with the pelt 25 provided thereon through an advancing stroke. During the advancing stroke of the mandrel 15, the free end of the mandrel together with the pelt 25 will be moved through the inlet opening 37, and when the free end 24 of the mandrel 15
20 reaches the vertical roller pair 26, these rollers will be brought to rotate by the motors 27 in such direction that they act to counter the advancing movement of the mandrel, and the rollers 26 are simultaneously pressed against the side faces of the mandrel 15 by means of the pneumatic cylinders 30. A desired contact pressure can be selected by pressing an appropriate button on the control panel 44. When the free end 24 of the mandrel 15 reaches
25 the horizontal rollers 31, the rollers are also brought to rotate by means of the motors 32 as well as by means of the pneumatic cylinders 35 they are pressed against the upper and lower surfaces 22 on the mandrel with a selected pressure. This contact between the rotating rollers and the flesh side of the pelt situated on the mandrel 15 causes that remains of flesh and fat are removed from the flesh side of the pelt, and the removed fat and flesh is sucked
30 into the suction mouthpieces 40 and thereby continuously removed from the apparatus through vacuum lines 41. As the mandrel 15 can be rotated about its longitudinal axis to

some degree, the rotary position of the mandrel may adapt itself to the position for the rollers 26 and 31.

When the processed fur is passed through the sawdust chamber 42, the moist flesh side of the pelt will be provided with a layer of sawdust. The flexible screen means 39 at the outlet opening 38 may include stiff brush hair-like means 45 which are somewhat directed in direction of the advancing stroke of the mandrel 15. These brush hair means will thus not prevent the movement of the pelt 25 through the outlet opening 38 during the advancing stroke of the mandrel 15. However, when the mandrel has reached its extended position, at which the free end part of the mandrel with the pelt applied thereon has passed through the outlet opening 38, the advancing movement of the mandrel 15 is stopped. The mandrel 15 is now moved back to its initial position shown in Fig. 1 by means of the piston of the cylinder 14 which is now driven the opposite direction. During this return stroke of the mandrel, the brush hair means 45 will engage with the scraped pelt 25 provided with sawdust in a similar way as barbs, whereby the processed pelt is drawn off the mandrel 15 as illustrated in Fig. 3. When the mandrel 15 has been moved back to its initial position shown in Fig. 1, it is ready to receive yet a pelt to be processed, and the above described operation can be repeated.

As it most clearly appears from Fig. 4, each of the rollers 26 and 31 have largely plane end faces 46 and a peripheral face 47 extending between these end faces. The peripheral face 47 has a number of teeth 48 peripherally spaced apart with scraper edges 49 determining or located on a largely circular cylindric surface. Each of the scraper edges 49 are mainly V-shaped and form an obtuse angle. The peaks of the V-shaped scraper edges 49 are located in a plane of symmetry extending at right angles to the axis of the roller. In a cross-sectional view, the roller has an outline resembling the outline of a circular saw blade, and the roller has an axial boring 50 for receiving the drive shaft of a driving electric motor.

The roller, cf. Fig. 4, which preferably is made of rubber, plastic material or similar resiliently yielding material, is brought to rotate in the direction indicated by arrow 51 in Fig. 4. This means that the fur or the pelt processed at first will be brought to engage the free outermost ends 52 of each of the scraper edges 49, and during the continued rotation

of the roller the two engagement points of each of the scraper edges will move in direction towards the central plane of symmetry of the roller. Due to this, the roller will tend to pull the pelt in direction against this central plane. This fact in combination with the offset disposition of the two roller pairs 26 and 31 will provide that fat and flesh remains will also
 5 be removed from the parts of the pelt 25 located along the edges of the mandrel 15.

The rollers 26, 31 used in the apparatus shown in Figs. 1-3 may have different diameters in the two pairs of rollers. By the embodiment shown on the drawing, the vertical rollers 26 cooperating with the side faces 23 of the mandrel 15 thus have a diameter which is less than
 10 the diameter of the horizontal rollers 31 cooperating with the upper and lower faces 22 of the mandrel 15. The rollers 26, 31 are mounted on the shafts of the electric motors 27 and 32 such that they can easily be released and replaced.

By the preferred embodiment, the horizontal rollers 31 have an axial length of 155 mm, and
 15 the diameter of the circular cylindric surface formed by the scraper edges 49 of the roller is 130 mm, the axial boring 50 diameter is 32 mm, the roller has seven teeth 48 with scraper edges 49, and each of the V-shaped scraper edges form an angle of 145°. Each of the vertical rollers 26 has a length of 85 mm, and the diameter of the circular cylindric surface determined by the scraper edges 49 is 65 mm, the diameter of the axial boring 50 is 17 mm,
 20 there are five teeth 48 with scraper edges 49, and each of the V-shaped scraper edges form an angle of 175°.

Fig. 5 shows and embodiment of a scraper roller 26 driven by an electric motor 27 which via a gearing 54 simultaneously drives a secondary scraper roller 56 such that a mandrel 15
 25 with a pelt mounted thereon is moved past the scraper roller 26 at first, and then past the secondary scraper roller 56. The gearing 54 is arranged rotatably in such a way that the scraper roller 26 can be pressed against a side of a pelt mounted on the mandrel 15, without the secondary scraper roller also having to be pressed against the side of the pelt or the mandrel 15.

30 On the other hand, the gearing 54 can be arranged rotatably such that both the scraper roller 26 and the secondary scraper roller simultaneously can be pressed against the side of the pelt mounted on the mandrel 15. Finally, the rotatable arrangement of the gearing 54 allows

for only the secondary roller 56 being pressed against the side of a pelt mounted on the mandrel 15 when the latter is moved as shown with broken lines in Fig. 5, where it is also shown at the top that the primary scraper rollers 26 are rotated against direction of movement of the mandrel at opposing sides of the mandrel 15, and that the lesser secondary scraper rollers 56 will also be rotated against the direction of movement of the mandrel 15.

The gearing 54 causes a rotational speed of the primary scraper rollers 26 of about 1400 rpm, whereas the lesser secondary scraper rollers 56 have a rotational speed of about 2200 rpm.

As it appears from Fig. 6, it is very easy to dismount and replace the primary scraper roller 26 as well as the secondary scraper roller 56 from vertical shafts 26' and 56' for the primary scraper roller 26 and the secondary scraper roller 56.

Fig. 7 shows a common screening 58 with space for primary scraper roller 26 and secondary scraper roller 56. Opposite the scraper roller 26, the screen has a suction branch 62 with a diameter of about 80 mm, and a separate, not shown suction branch of about 42 mm opposite the cavity 60 for the secondary scraper roller 56.

Figs. 8-13 shown photographic detail views of an embodiment of an apparatus according to the invention for illustrating the location along the mandrel 15 of primary scraper rollers 26 and secondary scraper rollers 56 which are arranged on a common gearing 54.

P a t e n t k r a v

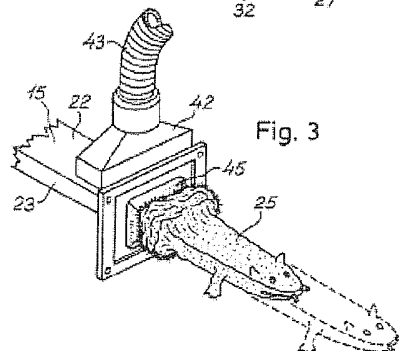
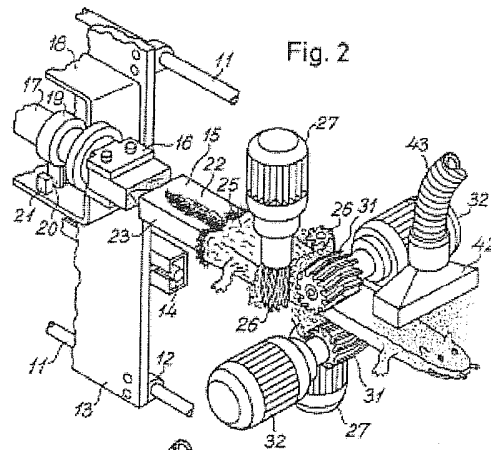
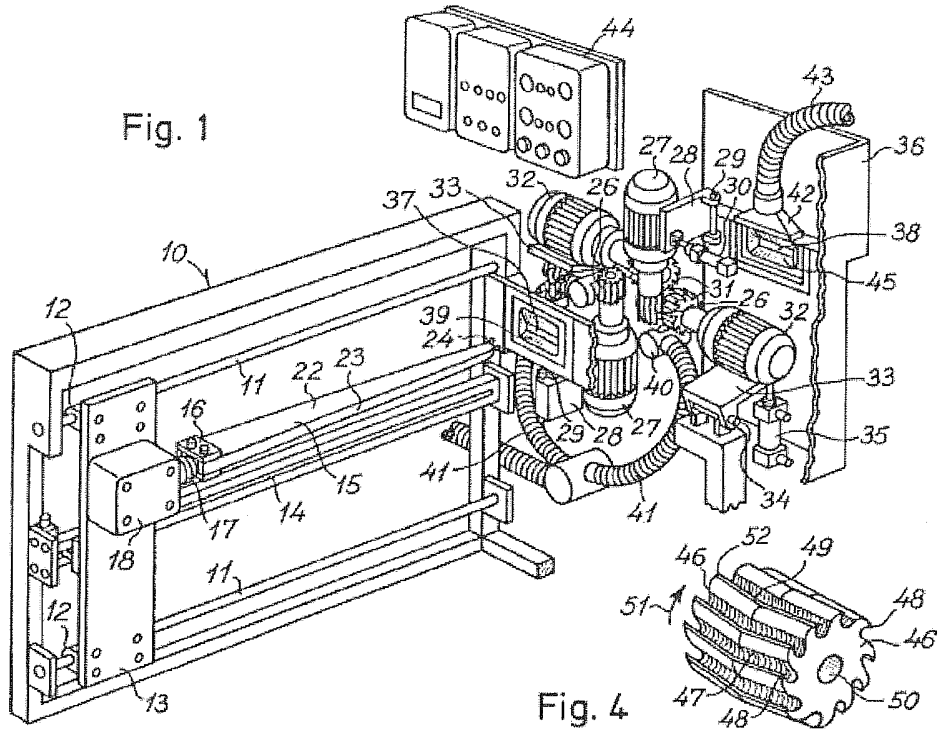
5 1. Indretning til behandling af pels, især minkpels, hvor indretningen har en langstrakt dorn (15) til at bære en pels (25), som er monteret derpå med kødsiden vendende udad, skraberuller (26,31) med skrabekanter (49), cylindermidler (30, 35), der er indrettet til at presse skrabekanterne (49) af skraberullerne (26, 31) til at ligge an mod kødsiden af den pels, der er monteret på dornen (15), og aktuatororganer (14) til at bevæge dornen (15) og skraberullerne (26, 31) i forhold til hinanden i længderetningen af dornen, hvor
10 skrabekanterne (49) på skraberullerne (26, 31) sammen danner en kontur, som i det væsentlige er komplementær til konturen af tværsnittet af dornen (15), **kendetegnet ved at** de to skraberuller (26), som er indrettet til at behandle pelsen på vertikale sider af dornen (15), hver især drives af en elektrisk motor (27), som via en udveksling (54) samtidig driver en sekundær skraberulle (56), som er indrettet til at presses mod delvis vertikale dele af
15 kødsiden af den pels (25), der er monteret på dornen (15).

20 2. Indretning ifølge krav 1, **kendetegnet ved, at** udvekslingen (54) er anbragt drejeligt på en sådan måde, at skraberullen (26) kun kan presses mod pelsen (25) på en vertikal side af dornen (15).

25 3. Indretning ifølge krav 1, **kendetegnet ved, at** udvekslingen (54) er anbragt drejeligt på en sådan måde, at skraberullen (26) og den sekundære skraberulle (56) samtidigt kan presses mod pelsen (25) ved en vertikal side af dornen (15).

4. Indretning ifølge krav 1, **kendetegnet ved, at** udvekslingen (54) er anbragt drejeligt på en sådan måde, at den sekundære skraberulle (56) kun kan presses mod pelsen (25) på en vertikal side af dornen (15).

1/4
PRIOR ART
(DK156669B3)



2/4
THE INVENTION

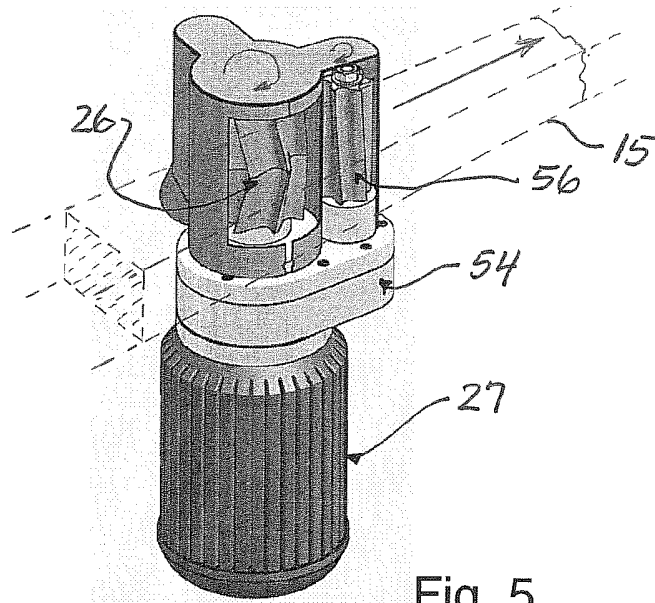


Fig. 5

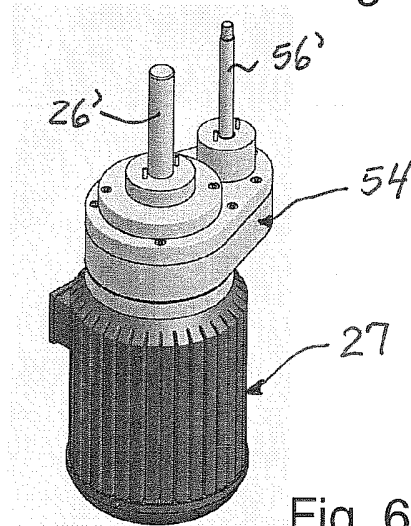


Fig. 6

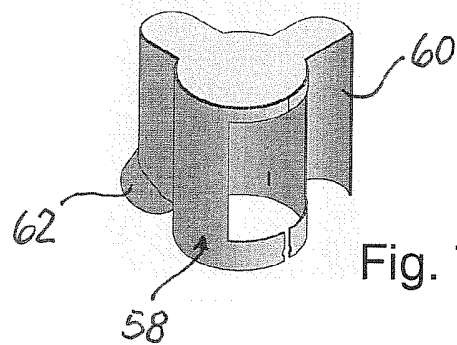


Fig. 7

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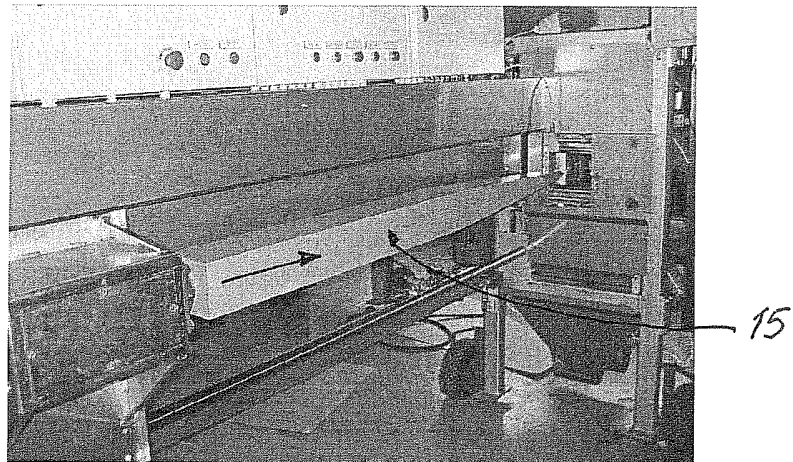


Fig. 8



Fig. 9

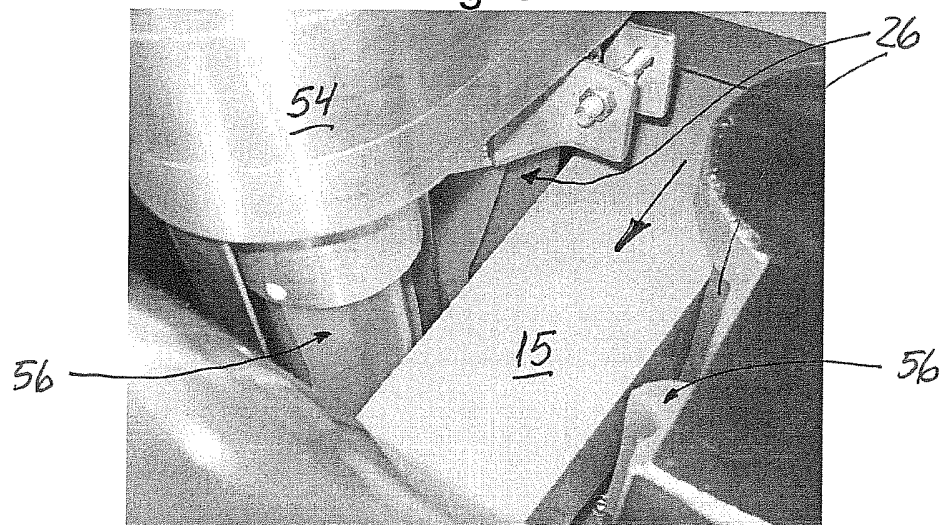


Fig. 10

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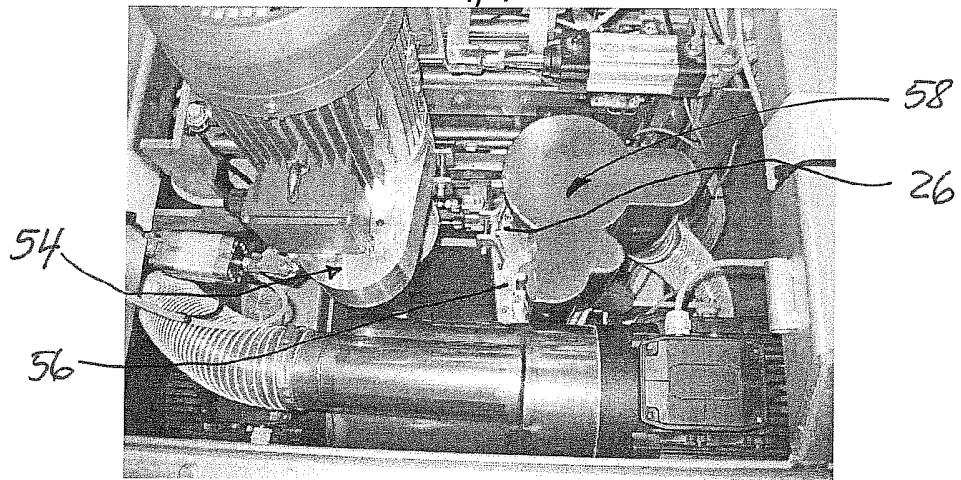


Fig. 11

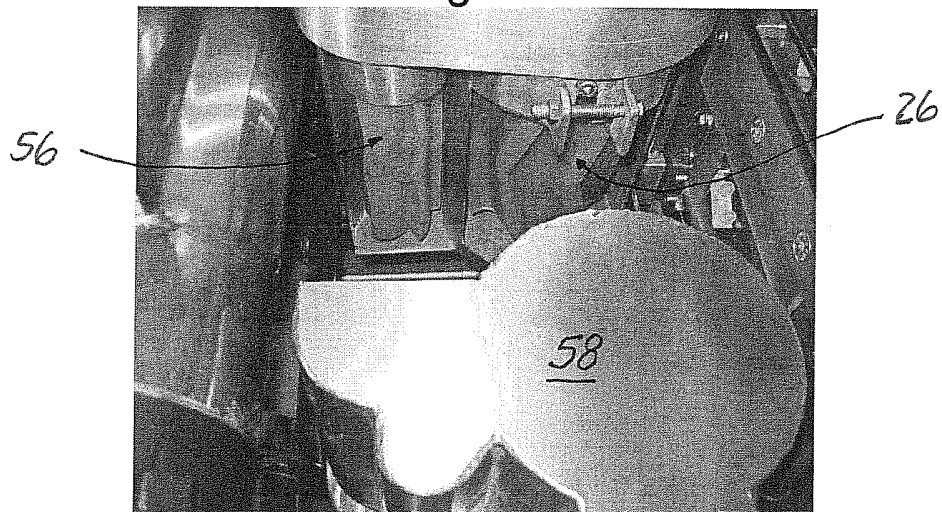


Fig. 12

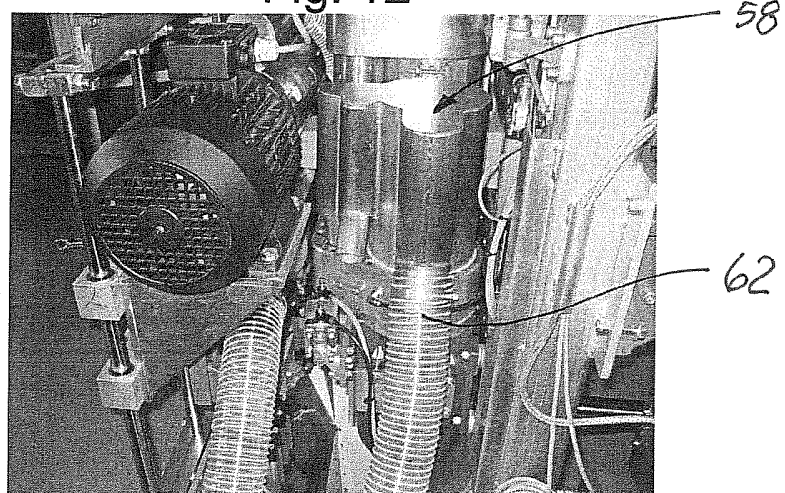


Fig. 13