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2,753,629

VACUUM DRIVEN CLIPPING OR SHEARING MACHINES

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Application May 25, 1954, Serial No. 432,178

Claims priority, application Great Britain May 30, 1953

1 Claim. (Cl. 30—210)

This invention relates to clipping or shearing machines for use for clipping sheep, cattle and other domestic animals, of the type in which a pair of relatively movable cutters derive movement from a source of vacuum; vacuum power is generally available at dairy farms for operating milking machines and it is a clean and convenient form of power transmission.

In the specification of British Patent No. 515,915 granted to Wolseley Sheep Shearing Machine Co. Ltd. and Hugh John MacNamara, there is described a vacuum driven clipping head in which the rocker which actuates the cutter is driven by vacuum and the power to the rocker is transmitted from a vane pivoted at, or near, one end edge within a chamber and adapted to rock in relation thereto, the vane being a substantially air-tight fit in the chamber and the vacuum being applied to alternate sides of the vane, the other side being subjected to atmospheric pressure.

In such a clipping machine, the rocker and the vane operating mechanism are arranged in a separate chamber below the vane chamber, the forward end of the rocker extending through the forward end of the chamber for coupling the rocker with the movable cutter.

A difficulty arising from this arrangement is that hair clippings escape into the chamber and ultimately the efficient working of the vane mechanism or some other part of the machine cannot be relied upon. The result is that the chamber becomes clogged with hair and the clipping of cattle can be slowed down or even stopped until the machine is dismantled and the defect is remedied.

The primary object of the present invention is to provide very simple and inexpensive means for avoiding the escape of hair clippings into the compartment or chamber.

According to the present invention a shearing or clipping head in which a rocker, housed in a rocker chamber, is driven by a vacuum operated mechanism and transmits reciprocating movement to a cutter, is characterised in that an elastic closure or seal is fitted in the rocker chamber between the cutter and the forward end of said chamber and is provided with a throat which embraces and grips the exterior of the rocker, so that the closure operates as a stopper which seals off the rocker chamber from the cutter against the ingress of hair clippings.

Preferably, the closure is of channel section and has a front wall provided with a central shroud which forms the throat. The interior of the closure has a rigid bridge of channel section and the flanges of the closure and the bridge are engaged by screws passing through the sides of the rocker chamber for pressing the flanges of the closure against the sides of the chamber.

A clipping or shearing head according to the invention will now be described by way of example with reference to the accompanying drawings:

Fig. 1 is a fragmentary longitudinal sectional view of a clipping head constructed according to the invention.

Fig. 2 is a cross section of Fig. 1 taken on the dotted line 2—2.

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Fig. 3 is a cross section of Fig. 1 taken on the dotted line 3—3.

Fig. 4 is a plan of the closure and its bridge.

Fig. 5 is a plan of the bridge in Fig. 4.

Fig. 6 is a longitudinal section of Fig. 4.

In these drawings A is a casting constituting the main part of the casing of the head and comprising the main portion of a wedge-shaped upper chamber B, the rest of which is comprised in a cover piece A¹. The casting A also comprises a lower chamber C, closed at the bottom by a detachable plate *a*. A wall *b* divides the chamber B from the chamber C. Within the chamber B is mounted a flap D having an upper trunnion *d* pivoting in a recess formed in the inner surface of the cover A¹. The flap has a lower trunnion *d*¹ passing down through a bore formed through the dividing wall *b*.

Suitable cup leathers form airtight packings between the flap D and all the wall surfaces of the chamber B.

To the bottom of the trunnion *d*¹ is rigidly secured a short lever E carrying on its under surface, and near the free end, a roller *e* which engages in a slot of a rocker arm F. The forward end of the rocker F has a pivotal joint F¹ with a cutter G for reciprocating the latter in a usual manner.

The rear end of the casting A comprises a part of a valve chamber H, the rest of which is comprised in an end cover J which is integral with a nozzle to which is connected a vacuum pipe not shown. The cover J is shown broken away. The chamber H is subject to atmospheric pressure.

At the inner end of the chamber H is an inset plate K forming a valve face having in it three ports, namely, a middle port and two side ports. The middle port is an exhaust port and connects with the bore of the nozzle J. The two side ports connect to the chamber B at the two sides of the flap D. The valve consists of a cup of plastic composition set in the upper end of a rocker P pivoted to the casing A. The rocker P has, at its lower edge, two concave curves engaged by a roller *q*, mounted on the rear end of a spring rod Q which passes forwardly through a recess into the chamber C. The roller *q* is held against one or the other of the curves by a coil spring *p*³. The rod Q is bent up at its forward end and such bent up portion *q*¹ passes up through a hole in the rocker F. The portions of the rocker which lie at the two sides of the roller *e* are bent down at and the spring rod Q passes between these bent down portions. When, therefore, the rocker is swung to one side by the lever E it takes with it the forward end of the rod Q and one of the bent down portions also presses the rod over and causes the roller *q* to move over from the one curve of the rocker P to the other curve thereof, thus rocking the rocker P to cause the valve to move over. In doing this it uncovers one of the side ports exposing it to atmospheric pressure in the chamber H and it causes it to connect the other side port with the middle vacuum port. The valve therefore acts in the same way as a slide valve of a steam engine and the flap D is reciprocated in the chamber B. As such, the machine is substantially of the construction disclosed in the aforementioned British Patent No. 515,915 and the essence of this invention will now be explained.

Between the forward end of the rocker chamber C and the cutter G is a flexible rubber closure or seal 1 which is arranged to function as a stopper for preventing hair from entering the chambers C and H. This closure is mainly of channel section and comprises a web 2, provided with a transverse rib 3, side walls 4, a front wall 5, a throat or tube 6 extending centrally from said wall 5, laterally and forwardly projecting corner ribs 7 and bellows-like ribs 8, one on each side of the throat 6 for increasing the flexibility of the wall 5. A metal bridge 9, also of channel cross section, rests within the closure 1

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and its side flanges 10 have coaxial tapped holes 11 aligned with holes 12 in the side walls 4. The closure 1 and the bridge 9 are secured within the chamber C by means of screws 13 passing through the opposite side walls of the chamber C, through the holes 12 in the side walls 4 and tightening into the tapped holes 11 in the bridge 9 so as effectively to support the closure 1 within the chamber C in a hair-tight manner whilst at the same time permitting the front wall 5, the throat 6, the ribs 7 and the ribs 8 to retain their inherent flexibility.

The rocker bar F and the throat 6 have the same cross sectional shape but the bore of the throat is less than the cross section of the bar in order that the throat 6 will tightly grip the exterior of the bar F so as to exclude hair cuttings. An external bead 14 surrounding the tip of the throat 6 abuts against the pivotal joint F¹.

In the operational position of the resilient closure 1, it will be seen that the detachable plate *a* beds against the rib 3 of the web 2, that the side walls 4 are pressed by the screws 13 into physical contact with the sides of the chamber C, that the corner ribs 7 seat against the forward corners of said chamber, and that the tip 15 of the wall 5 seats against the arch 16 of the stationary cutter head. The result is that the closure 1 blocks and seals off the chamber C against the ingress of hair clippings and the rocker bar F, being tightly gripped by the tube 6, acting as a shroud, prevents the escape of such clippings via the said bar during its movement; the ribs 8 assist the flexibility of the wall 5 during said movements.

I claim:

In a pneumatic hair clipping machine having a fixed cutting blade, a reciprocating blade cooperating therewith, a rocker arm operatively connected to the reciprocating blade, a rocker arm passage of a substantially rectangular

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cross-section and an upwardly extending wall member at the front of said passage; a seal formed integrally from flexible rubber-like material and comprising a bottom wall, a front wall and a pair of side walls integral with said bottom wall, a transverse rib provided at the underside of said bottom wall and adapted for sealing engagement with the bottom of the stated passage, a pair of laterally and forwardly projecting ribs provided at the junction of said front wall with the respective side walls and adapted for sealing engagement with opposite sides of the stated passage, the upper portion of said front wall constituting a lip projecting beyond upper edges of said side walls and adapted for sealing engagement with the stated wall member, a forwardly projecting hollow throat provided on said front wall and adapted for sealing engagement with the stated rocker arm, bellows-like expansion and reinforcing ribs provided on said front wall between said throat and said laterally and forwardly projecting ribs, a substantially rigid bridge disposed in said seal and provided at opposite sides thereof with screw-threaded apertures in register with openings provided in said side walls, and screws extending through said openings into said apertures for urging said laterally and forwardly projecting ribs on said side walls in sealing engagement with sides of the stated passage.

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