

- [54] **SEPARATING APPARATUS WITH A DRIVE FOR THE CONVEYOR**
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- [58] **Field of Search** 209/247, 333, 261, 291, 209/334, 339, 340; 198/203, 363, 364

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Attorney, Agent, or Firm—Stevens, Davis, Miller & Mosher

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[57] **ABSTRACT**
A separating apparatus with a conveyor for loose material comprising an endless flexible element, to which a plurality of radially projecting spaced members are fixed, which are slidable in a guide so as to push and convey the loose material charged in said guide, and drive means including a rotative cylindrical rotor, having substantially radial blades, said flexible element being wound on said rotor, so that the blades of the rotor engage the said projecting members, whereby said flexible element is advanced.

5 Claims, 4 Drawing Figures

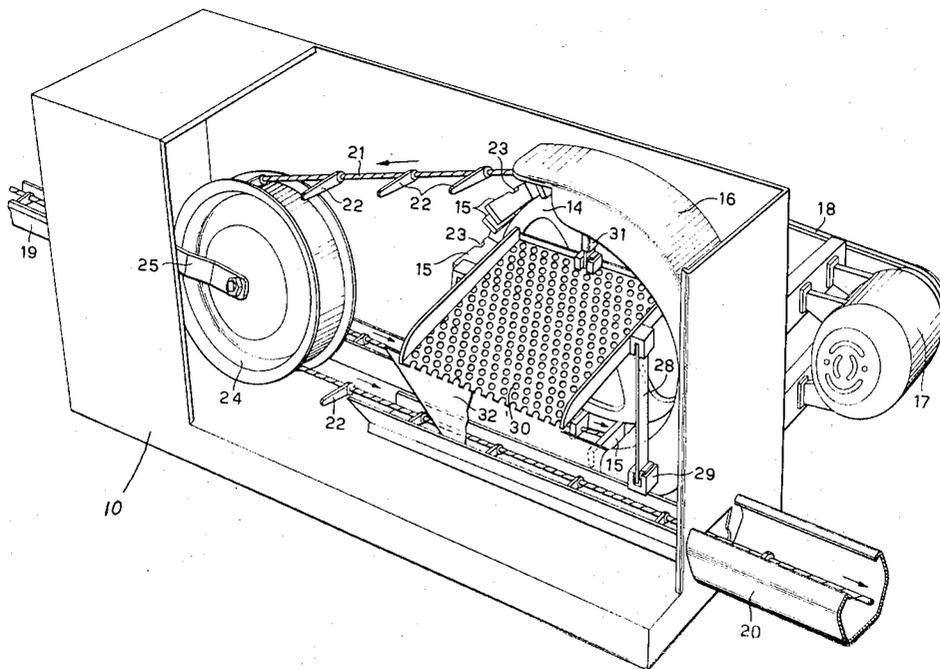
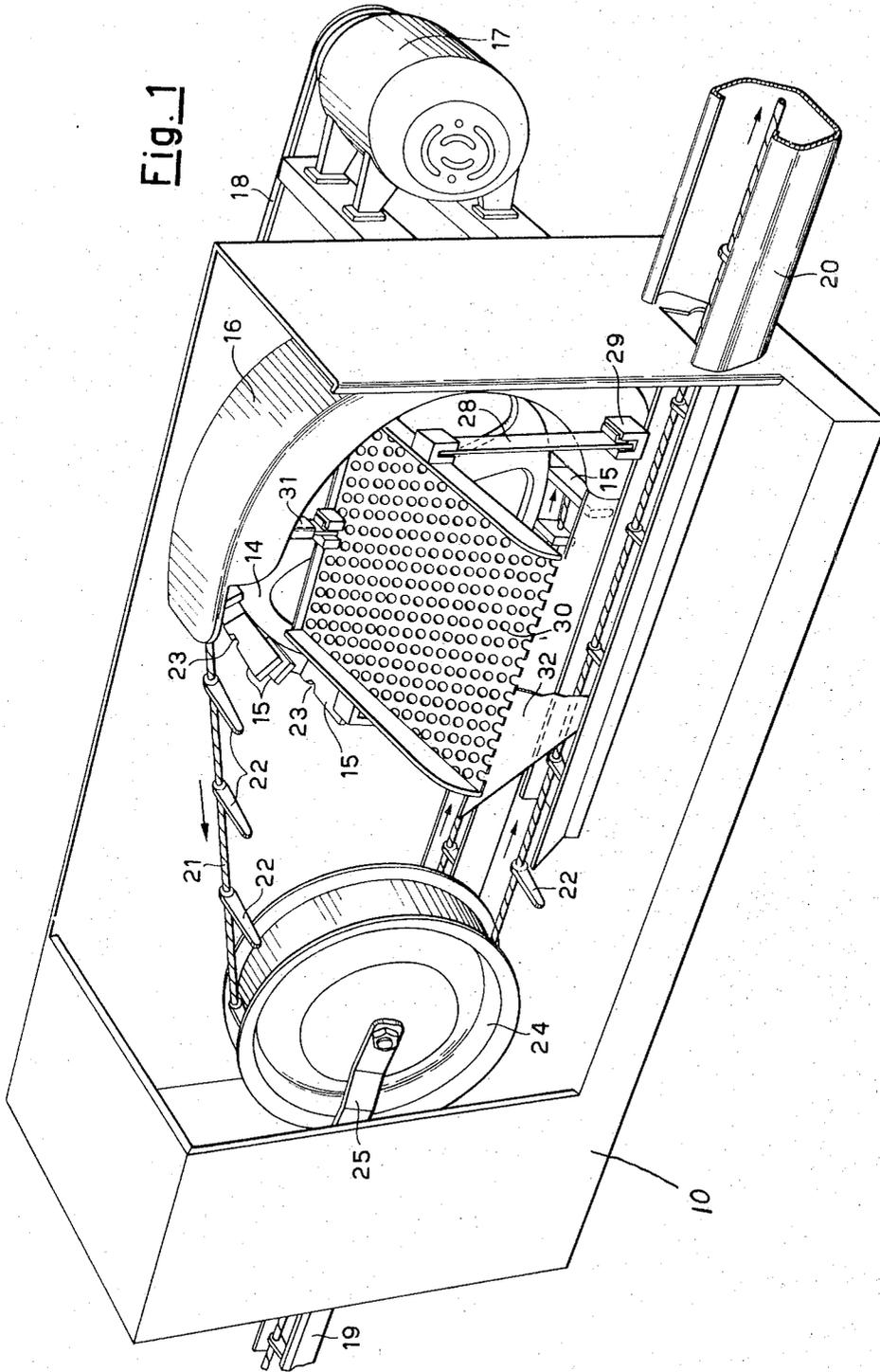


Fig. 1



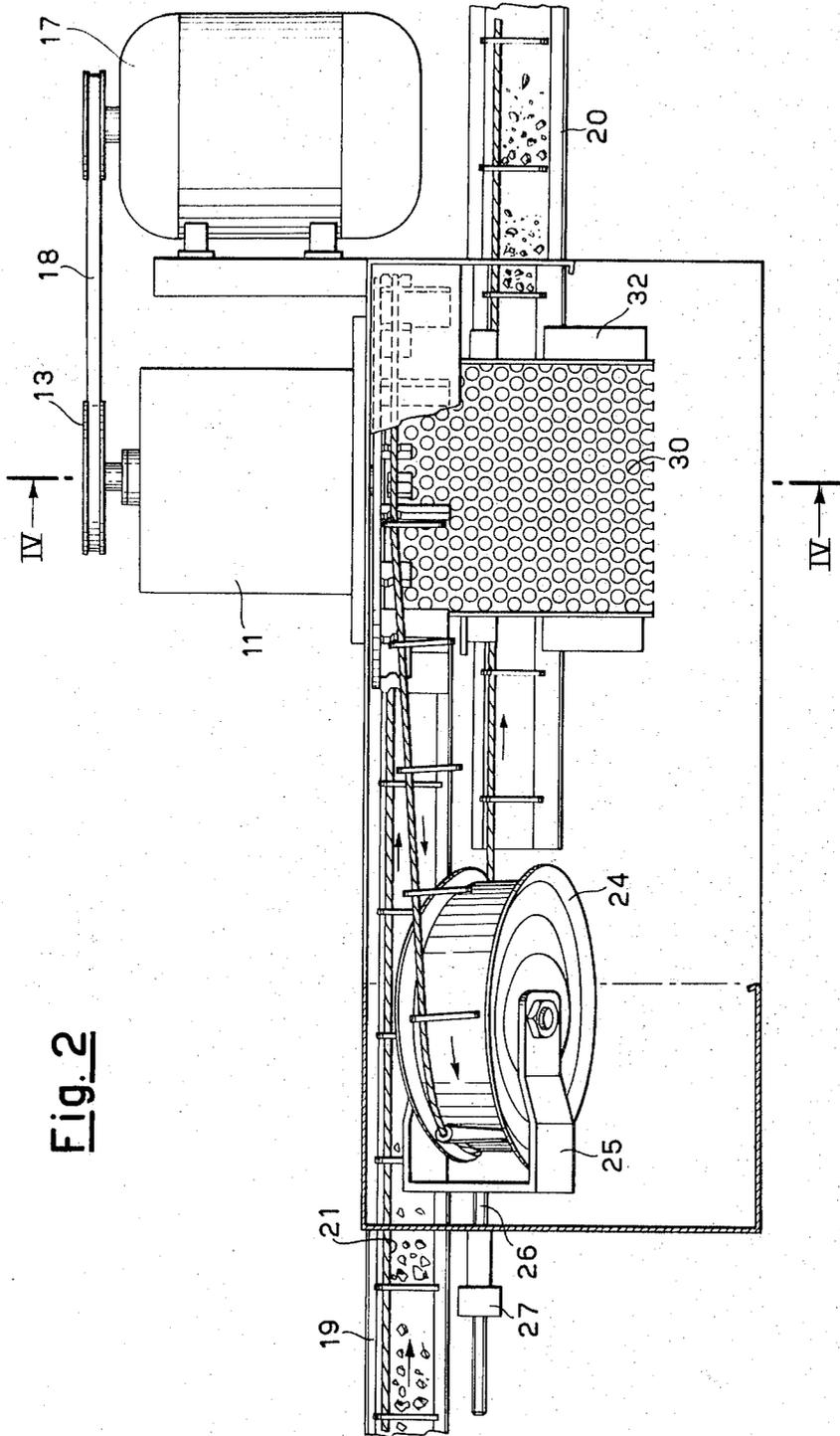


Fig. 3

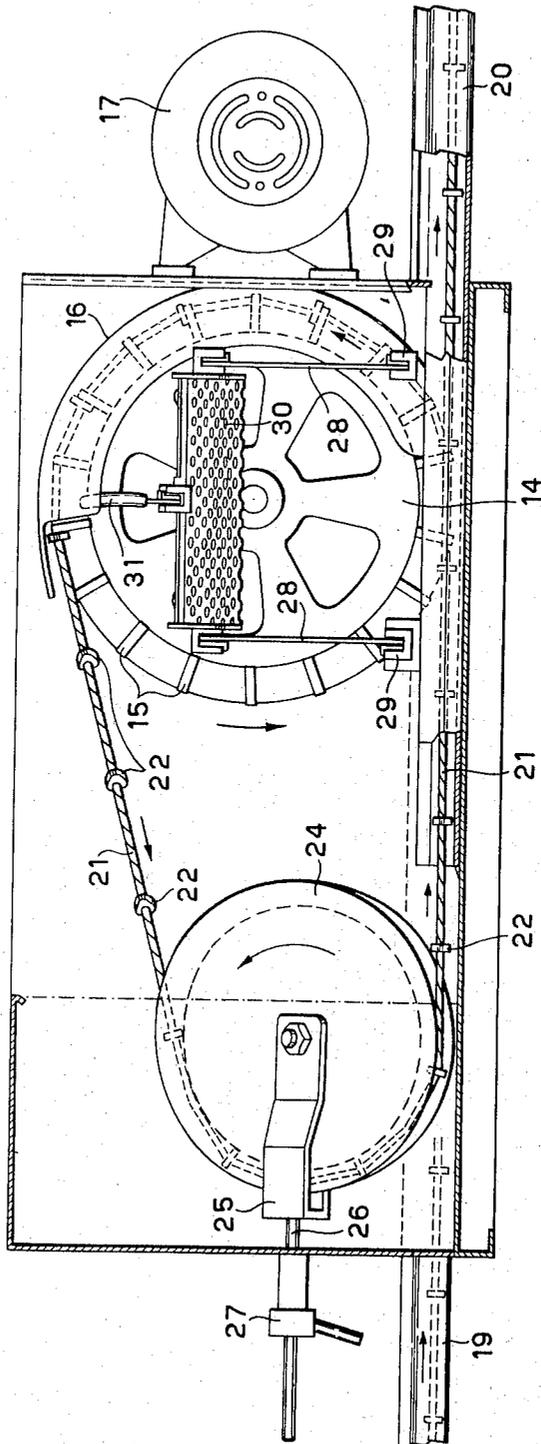
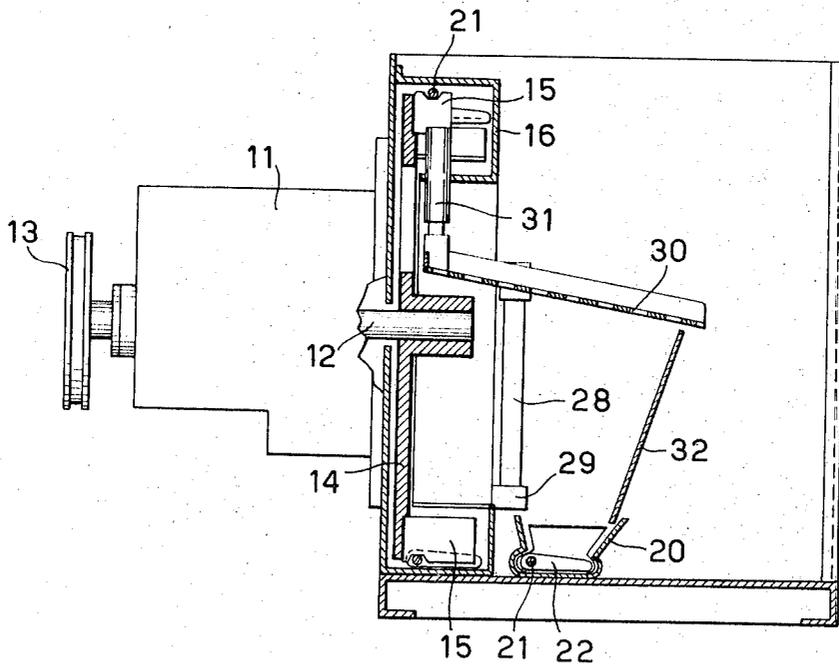


Fig. 4



SEPARATING APPARATUS WITH A DRIVE FOR THE CONVEYOR

Conveyors for loose materials are available in which a flexible element to which radially projecting spaced members are fixed is moved so that it slides in a guide which embraces the periphery of said members. In this manner the sliding of said element enables said members to drag the material along the guide. Normally said flexible member, which may for example be a cable, is configured in the form of a closed loop and runs for a part of its length in said guide, at one end of which the material is fed and is discharged at the other end.

The object of the present invention is to drive the flexible element by means of an apparatus which also enables the conveyed material to be screened.

According to the present invention the drive apparatus for a conveyor means, consisting of a flexible element to which a plurality of radially projecting spaced members are fixed and moved so as to slide in a guide in such a manner that said members act on loose material placed on said guide in the sense of pushing it so that it follows the movement of said flexible member, comprises drive means which rotate a cylindrical rotor with substantially radial blades, said flexible element being wound on said rotor, the blades of said rotor engaging with said members so that they drive said flexible element.

Preferably said rotor moves about a horizontal axis, at least partially within a housing which reproduces its form, said flexible element having its inlet branch disposed tangentially to the lowest part of the rotor, the material pushed by the members mounted on said inlet branch being grasped by said blades running in the proximity of said housing, and when said blades approach the highest position of the rotor, it falling towards the interior of the rotor and being conveyed through a screen to the guide of the outlet branch of said flexible element from the apparatus.

The characteristics and advantages of the apparatus according to the present invention will be more evident from the following description of one embodiment illustrated in the accompanying drawings in which:

FIG. 1 is a perspective view of the apparatus mounted on a partially shown conveyor chain;

FIGS. 2 and 3 are partially sectional plan and elevational views respectively of the apparatus shown in FIG. 1; and

FIG. 4 is a sectional view on the line IV—IV of FIG. 2.

As shown in the figures, the apparatus comprises an external casing 10 with which is rigid a support 11, in which a shaft 12 is rotably mounted. On one end of the shaft is keyed a pulley 13 and on the other end a rotor 14 provided with axial blades 15. A housing 16 partially embraces the blading, and reproduces its profile.

The pulley 13 is rotated by a motor 17 by means of a belt 18.

An inlet guide 19 reaches the apparatus and an outlet guide 20 is mounted parallel to it.

In a well known manner, the guides receive a flexible conveyor member consisting of a cable 21 on which radial blades 22 are fixed. The sliding of the blades in the guides, controlled by the driving of the cable, causes the movement of material placed in the guides in suitably small pieces.

The path of the cable in the apparatus is clearly shown in the drawing; it arrives from the guide 19 and is wound on the blading 15 of the rotor which is provided with notches 23 in which the cable 21 seats so that the blades 21 have their edge substantially aligned with the most external edge of the blades 15.

The cable which unwinds from the rotor is passed to a pulley 24 with a suitably inclined axis, so that the cable which leaves it is aligned with the guide 20, in which it is slidably housed.

The pulley 24 is idly pivoted on a fork 25 connected by a threaded shank 26 and a nut 27 to the frame 10 in an adjustable manner. By tightening the nut 27 of the shank 26, the distance between the pulley 24 and the rotor 14 is increased, so putting the cable 21 in a state of tension. Resilient members, not shown, may be interposed for stressing the cable in a yieldable manner.

A perforated screen 30 is supported by resilient laminations 28 rigid at 29 with the fixed part of the apparatus, and carries in its turn a resilient lamination 31 which engages against the internal surface of the blading 15.

A shield 32 is disposed as shown between the projecting edge of the screen 30 and the guide 20 to which it is fixed.

The operation of the apparatus illustrated is as follows: the rotor 14 when put into a state of rotation drives the cable 21 which is unable to slide on it because of the mutual engagement between the blades 15 and 22. It is therefore evident that the pitch of the rotor blades must correspond to the pitch of the cable blades, so that these latter seat correctly in the voids of the rotor.

At a loading station not shown in the figures the loose material is loaded on the guide 19 and dragged by the sliding of the cable and blades 22 into the housing 16 which constitutes the extension of said guide 19. The material is then transported by the rotor blades 15 which compel it to flow through the channel 16 to its highest point where it terminates. In this manner the material falls downwards on to the screen 30. The screen is suspended resiliently and the lamination 31 engages successively in the blades 15 so maintaining the screen in oscillating motion for vibrating the material which rests on it.

The perforations of the screen 30 allow the material which reaches the apparatus to be separated. The smaller sized particles pass through the perforations of the screen and fall, contained by the wall 32, into the guide 20 from which they are removed by the bladed cable. The larger sized particles travel across the surface of the screen until they fall beyond its edge where they are collected in a manner which is not shown in the figures.

As is usual in this type of continuous conveyor, the cable 21 is in the form of a closed loop, so that it passes continuously through the described apparatus which drives it in addition to carrying out the separation of the material.

The use of apparatus of this type has been particularly advantageous for conveyor and distribution chains for fodder for animal breeding places, in which a sifting of the conveyed material is particularly useful so as to eliminate foreign bodies which may be accidentally mixed with the fodder.

As stated the apparatus according to the invention provides an extremely reliable drive for the bladed

cable which is wound through a wide angle on its circumference. The combination of this drive function with the capacity to sift the material makes the apparatus according to the invention extremely advantageous, it being moreover of very small bulk, easy construction and easy assembly on the conveyor lines.

Various modifications may be made to the apparatus described without leaving the scope of the present invention.

In particular the idler formed by the pulley 24 may be avoided, i.e., the cable may make a complete turn, of helical form, on the rotor. In this case the external housing 16 must be of suitable configuration for receiving the blades of the rotor and the blades mounted on the cable, each of them collaborating to drag the material.

Evidently the described apparatus may be easily adapted to many embodiments of the conveyor member constituted by the cable and radial blades connected to it, coupled with suitable guides.

What is claimed is:

1. A separating apparatus comprising a drive for a conveyor consisting of a frame, a cylindrical rotor mounted on said frame and having substantially radially spaced blades extending therefrom, a housing at least partially embracing said rotor, an inlet guide mounted on said frame and operatively connected to said housing, a flexible element to which are fixed a plurality of radially projecting spaced members slidable within said inlet guide and wound around said rotor in engaging contact with said blades to move material

from said inlet guide to said housing, a screen mounted interiorly of said rotor blades to receive material discharged by gravity from said housing, an outlet guide positioned below said screen to receive material passing through said screen, means to oscillate said screen, means to rotate said rotor to drive said flexible element and means to tension said flexible element, said rotor being internally hollow and rotatable about a horizontal axis.

2. The apparatus as claimed in claim 1, in which said inlet guide member and outlet guide member are positioned coplanarly and parallelly to each other.

3. The apparatus as claimed in claim 1, in which said flexible member is a cable and said tensioning means includes a pulley, said cable being wound from said inlet guide member around said rotor from its lowest to its highest position to said pulley, around said pulley and fed to said outlet guide.

4. The apparatus as claimed in claim 1, in which said oscillating means includes resilient elements attached to said base and screen to support said screen and a resilient appendage attached to said screen and yieldably engaging said blades of said rotor to oscillate said screen when said rotor is rotated.

5. The apparatus as claimed in claim 3, in which said tensioning means include a fork on which said pulley is pivoted and connected to said frame by a shank mounted by a nut, said pulley being adjustable toward and away from said rotor to loosen or tighten said cable.

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