April 19, 1927. 1,625,653

M. O. HAEGER

CONVEYER ROLLER FEED

Filed Jan. 20, 1926 2 Sheets-Sheet 1

Fig. 1

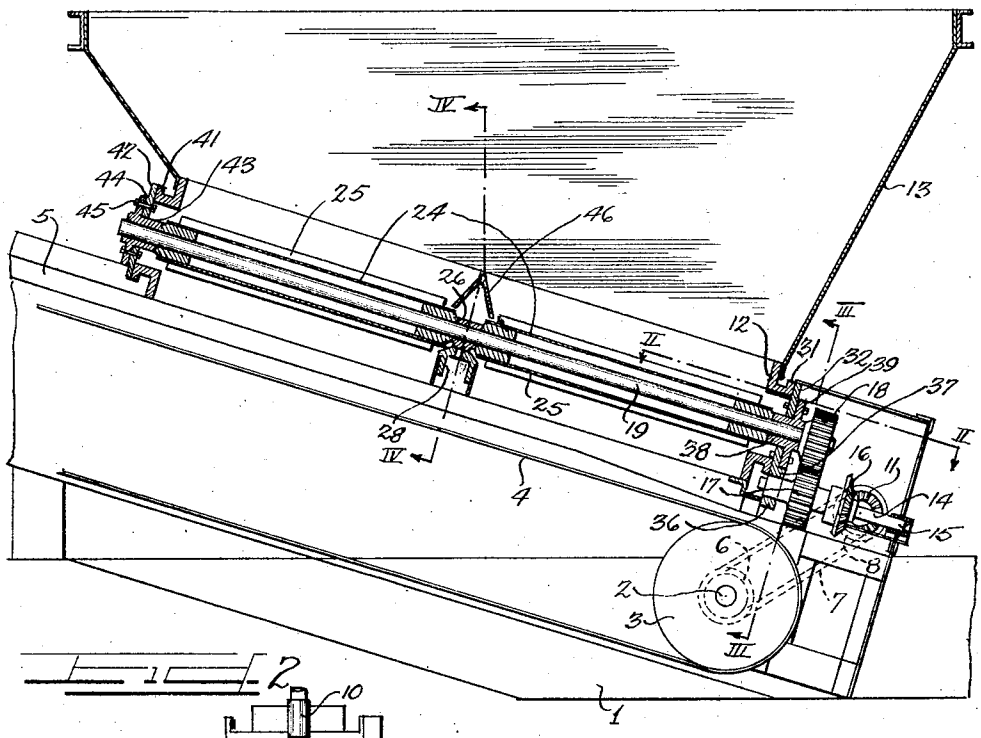
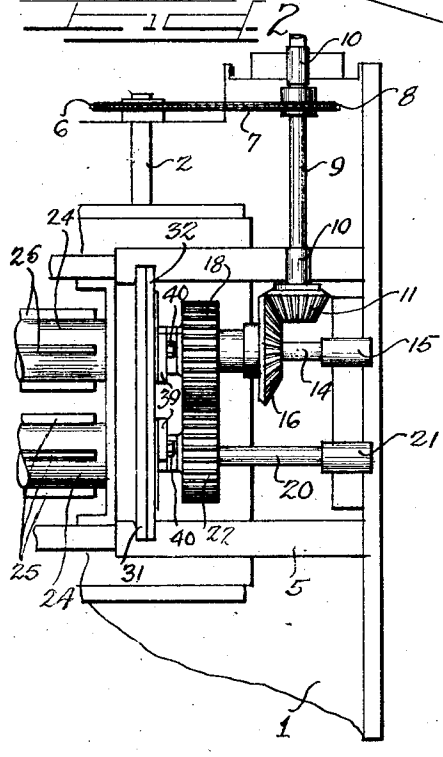


Fig. 2



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Filed Jan. 20, 1926 2 Sheets-Sheet 2

FIG. 3

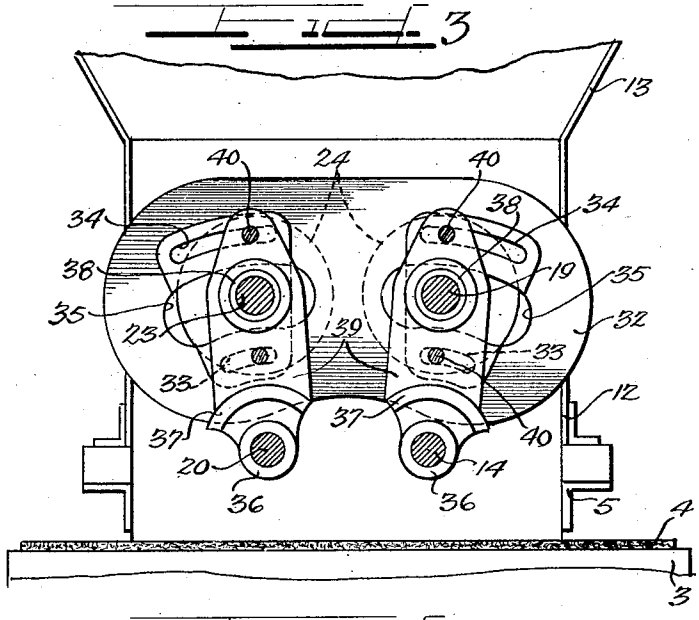
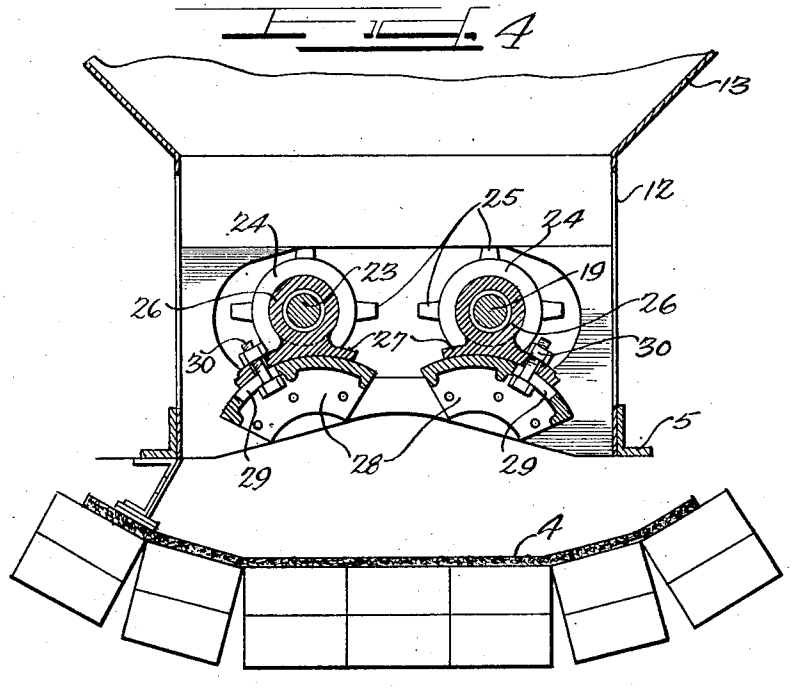


FIG. 4



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UNITED STATES PATENT OFFICE.

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CONVEYER-ROLLER FEED.

Application filed January 20, 1926. Serial No. 82,420.

This invention relates primarily to a roll feeding device for use in connection with conveyers of sand suckers or dredges to permit the sand or other material when dumped into a receiving hopper to drop onto rotatable adjustably mounted rolls which act to feed the material therebetween onto a travelling belt or conveyer in a uniform manner, leaving sufficient space for freedom of motion between the material on the travelling belt and the material feed control rollers.

It is an object of this invention to provide an improved roller feed device for sand suckers and dredges, said device being provided with feed rolls carried on adjustable supports to permit control of the quantity of material fed between said rolls upon a travelling belt.

It is also an object of this invention to provide a protecting device for the continuous belt of a sand sucker or dredge so that material to be delivered onto said belt is first delivered onto the protecting device for gradual delivery onto the belt, thereby relieving the belt of excessive shocks and strains to which same would be subjected in case the material was delivered directly onto the belt.

It is an important object of this invention to provide a protective roller feed control mechanism between a travelling belt and a hopper, said control mechanism having the feed rollers thereof mounted on adjustable supports to permit the rollers to be moved toward and away from one another to receive material from the hopper and then gradually feed the material onto the belt to obviate the imparting of shocks and strains to the belt and to carry the weight of the material in the hopper.

Other and further important objects of this invention will be apparent from the disclosures in the specification and the accompanying drawings.

This invention (in a preferred form) is illustrated in the drawings and hereinafter more fully described.

On the drawings:

Figure 1 is a fragmentary vertical longitudinal section of a portion of a sand sucker or dredge equipped with an improved roller feed mechanism embodying the principles of this invention.

Figure 2 is a fragmentary transverse view of the device taken on line II—II of Figure 1.

Figure 3 is an enlarged fragmentary detail section taken on line III—III of Figure 1.

Figure 4 is an enlarged fragmentary transverse section taken on line IV—IV of Figure 1.

As shown on the drawings:

The reference numeral 1 indicates the deck section of a sand sucker or dredge having mounted thereon a transverse shaft 2 supported in suitable bearings and having mounted thereon a pulley or drum 3 around which an endless belt or conveyer 4 is trained. The endless belt or conveyer 4 is directed upwardly in an inclined plane and has the upper bight thereof trained around a pulley or roller supported on a shaft journalled in suitable bearings on the feeder frame 5. Mounted on one projecting end of the belt driving shaft 2 is a sprocket 6 around which a driving chain 7 is engaged. The chain 7 is also engaged around a sprocket 8 (Figure 2) mounted upon a stub shaft 9 journalled in suitable bearings 10 on the feeder frame. Secured on the inner end of the transverse stub shaft 9 is a bevelled pinion 11.

Mounted upon the inclined feeder frame 5 above the belt 4 is a housing or casing 12 open at the bottom and at the top. Securely mounted on the top of the open housing 12 is a material feed hopper 13 adapted to receive the sand or other material which is to be delivered onto the endless conveyer or belt 4.

A material control device is mounted in the housing 12 below the hopper 13 to intercept and support the material before it is delivered to the endless belt or conveyer 4. The roller feed mechanism comprises a drive shaft 14 mounted in suitable bearings 15 on the frame 5. Mounted on the drive shaft 14 is a bevelled pinion 16 which is in mesh with the bevelled pinion 11 and receives a drive therefrom. Also mounted on the drive shaft 14 is a lower gear 17 which is in mesh with

an upper gear 18 mounted on the lower end of a feed roller shaft 19. Also meshing with the lower drive gear 17 is a lower gear which is mounted on an idler shaft 20 supported in bearings 21 on the feeder frame. It will thus be seen that the idler shaft 20 and the gear thereon are adapted to be driven from the drive shaft 14. The gear on the idler shaft 20 is in mesh with an upper gear 22 mounted on the lower projecting end of a second feed roller shaft 23.

Secured upon each of the roller feed shafts 19 and 23 within the housing 12 are a pair of feed rollers 24 each of which is provided with a plurality of spaced longitudinal ribs or webs 25. The rollers 24 on each of the shafts 19 and 23 are separated at their adjacent ends by means of a middle bearing 26, each of which is provided with an integral segment-shaped shoe 27. The shoes 27 are adapted to slide on segment-shaped supports 28 rigidly bolted in position within the housing 12 to afford sufficient supports for the shoes of the bearings 26. The supports 28 are provided with slots 29 (Figure 4) through which retaining bolts 30 are adapted to engage. The bolts 30 are adapted to hold the middle bearings 26 secured in an adjusted position upon the stationary supports 28.

Rigidly secured by means of bolts or other suitable means to the flange 31 on the lower open end of the housing 12 is a closure disk or plate 32, each half of which has formed therein a curved or segment-shaped lower slot 33, a segment-shaped upper slot 34 longer than the lower slot 33, and a large segment-shaped intermediate slot 35 (Figure 3). Integrally formed on the lower margin of each half of the closure plate 32 is a bearing sleeve 36 for supporting the inner ends of the stub shafts 14 and 20 respectively. Integrally formed on the closure plate 32 above the bearing sleeves 36 are two segment-shaped guide flanges 37. The lower end of each of the roller shafts 19 and 23 project through the lower open end of the housing 12 and through the respective intermediate slots 35 of the closure plate 32 and as already described, have the gears 18 and 22 secured on the outer projecting ends thereof. The lower end portions of the roller shafts 19 and 23 are supported in bearing sleeves 38 which have integrally formed thereon supporting plates 39 which carry lock bolts 40. The lock bolts 40 carried by the supporting plates 39 project through the respective slots 33 and 34 of the closure plate 32 thereby affording a means whereby the roller shaft supporting plates 39 may be moved toward or away from one another and rigidly secured in an adjusted or predetermined position with respect to the closure plate 32 so that the rollers on the shafts 19 and 23 may be adjusted to vary the space between the rollers for the purpose of controlling the feed of the material from the hopper 13 downwardly between the rotating rollers onto the travelling belt or conveyer 4. The bearings 38 for the shafts 19 and 23 are permitted to move through the intermediate slots 35 of the end closure plate 32 when the material feed rollers are adjusted with respect to one another.

Rigidly bolted to the flange 41 on the upper open end of the inclined housing 12 is an upper closure plate or disk 42 which is constructed similar to the lower closure plate 32 and is also provided with groups of segment-shaped slots 33, 34 and 35 similar to the arrangement illustrated in Figure 3. The upper ends of the shafts 19 and 23 are supported in bearing sleeves 43 which project through the intermediate slots 35 of the upper closure plate 42. The upper bearing sleeves 43 are provided with integral supporting plates or flanges 44 which carry bolts 45 which project through the closure plate slots 33 and 34 of said closure plate 42 to permit the upper ends of the shafts 19 and 23 to be locked in a predetermined or adjusted position corresponding to the adjustment of the lower ends of said shafts. As illustrated in Figure 1, a protecting hood or shield 46 is provided within the housing 12 for protecting the intermediate bearings 26 of the shafts 19 and 23 from the material being deposited upon the rollers 24 from the hopper 13.

The operation is as follows:

When a sand sucker or dredge is in operation, the material, such as sand, is delivered by means of buckets or other suitable means into the upper open end of the hopper 13 and is permitted to drop upon the rollers 24, the rollers being mounted in the housing 12 which forms the discharge end of the hopper and prevents the material from being deposited directly onto the travelling conveyer or belt 4, thereby relieving said belt or conveyer of the shocks or strains to which it would ordinarily be subjected in case the feed rollers were not used.

The driving shaft 9 is adapted to be driven from any suitable source of power and causes rotation of the chain 7 which in turn causes the drive to be transmitted to the shaft 2 and the pulley or drum 3 to cause the drive to be transmitted to the endless belt or conveyer 4. The driving shaft 9 also causes the drive to be transmitted through the meshing bevelled gears 11 and 16 to cause operation of the lower gear 17 and the gear on the idler shaft 20 so that the drive is thereby transmitted to the upper gears 18 and 22 mounted on the lower projecting ends of the roller shafts 19 and 23. It will thus be seen that the drive is transmitted to the shafts 19 and 23 to cause rotation of the rollers 24 inwardly toward one

another so that the material deposited from the hopper upon said rollers is gradually and evenly fed downwardly by means of the roller ribs or webs 25 between the rollers and onto the travelling belt 4 without having the full weight of the material in the hopper brought to bear upon said belt. The quantity of material delivered by the rollers from the hopper 13 onto the belt may be controlled by adjusting the shafts 19 and 23 with respect to one another. This is done by releasing the retaining bolts 40 thereby permitting the supporting plates 39 and 44 to be slidably adjusted on the respective end closure plates 32 and 42 after which the retaining bolts are again tightened to hold the shafts and respective rollers in their adjusted position. It will thus be seen that the quantity of material from the hopper 13 is adapted to be controlled and when deposited upon the rotating rollers 24 is delivered downwardly between said rollers upon the travelling belt 4 which carries the material upwardly out of the sand sucker or dredge 1 to be delivered into suitable containers or conveyers which will deliver the material to the points desired.

I am aware that many changes may be made, and numerous details of construction may be varied through a wide range without departing from the principles of this invention, and I therefore do not purpose limiting the patent granted hereon, otherwise than necessitated by the prior art.

I claim as my invention:

1. The combination with a material receiving hopper, of a conveyer belt mounted therebelow, parallel roller feed mechanisms positioned between said hopper and belt, and slidable bearings for the roller feed mechanisms adapted to permit the roller feed mechanisms to be adjusted radially with respect to one another to control the flow of the material from said hopper onto said belt.

2. The combination with a material feed hopper, of a conveyer belt mounted therebelow, a pair of parallel feed roller mechanisms mounted between said hopper and said belt, means for driving the belt and said feed roller mechanisms, and pivoted supports for said feed roller mechanisms adapted to permit said parallel feed roller mechanisms to be adjusted through an arc to vary the distance therebetween to control the flow of the material from said hopper onto said belt.

3. A conveyer roller feed device comprising a material feed hopper, a belt mounted therebelow, means for driving said belt, material feed rollers between said hopper and said belt, arc shaped supports for said rollers, and means adapted to permit the rollers to be adjusted transversely with respect to one another on said supports to permit the rollers to receive the material from said hopper and gradually deliver the same to said belt to relieve said belt of undue stresses and strains.

4. A conveyer roller feed device comprising a hopper, a conveyer mounted therebelow, means for driving said conveyer, rotatable feed means positioned between said conveyer and hopper, and slidable bearings for the feed means to permit adjustment thereof to control the flow of the material from said hopper onto said conveyer.

5. A conveyer roller feed device comprising a hopper, an endless conveyer mounted therebelow, feed rollers adjustably mounted with respect to one another below said hopper to govern the flow of material from said hopper onto said belt, and driving means connected with said endless conveyer and with said feed rollers to drive the same.

6. A conveyer roller feed device comprising a frame, a housing supported on said frame, a hopper mounted on said housing, a conveyer mounted on said frame below said housing, material feed rollers mounted in said housing between said hopper and conveyer, adjustable supports for said feed rollers adapted to permit said rollers to be moved toward or away from one another to vary the space therebetween, and driving mechanisms connected with said feed rollers and with said conveyer to operate the same to cause material from said hopper to be gradually fed by said feed rollers onto said conveyer and further adapted to relieve the conveyer of the weight of the material in said hopper.

7. A conveyer roller feed device comprising a frame, an endless conveyer mounted thereon, a housing mounted on said frame above said conveyer, pivotally mounted supports on said housing, feed rollers supported on said pivotally mounted supports, means for holding said pivotally mounted supports in adjusted position, gear mechanisms for operating said feed rollers, driving means connected to operate said gear mechanisms and said conveyer, and means connected with said housing for delivering a material onto said feed rollers for gradual delivery onto said conveyer.

8. A conveyer roller feed device comprising a frame, an endless conveyer supported thereon, a housing mounted on said frame above said conveyer, a hopper connected with said housing for delivering material thereto, a plurality of parallel roller mechanisms mounted within said housing for supporting the material within said hopper prior to delivery onto said conveyer, slotted closure plates for the ends of said housing, adjustable supports on said closure plates for supporting said roller mechanisms, means for locking said adjustable supports in a predetermined position on said closure plates to hold the roller mechanisms in ad-

justed spaced relation, and driving means on said frame connected to operate said roller mechanisms and said conveyer to cause said roller mechanisms to deliver material from said hopper onto said conveyer.

9. A conveyer roller feed device comprising a frame, an endless belt mounted thereon, a housing on said frame above said belt, a hopper on said housing for delivering a material thereto, feed rollers in said housing, adjustable bearing supports for said feed rollers, means for locking said bearing supports in adjusted positions, and driving mechanisms connected with said feed rollers and with said belt to operate the same to cause the material from said hopper to be delivered in predetermined quantities on said belt.

10. The combination with a material feed belt, of a plurality of parallelly disposed feed rollers mounted longitudinally above said belt, adjustable supports for said feed rollers adapted to permit said feed rollers to be moved toward or away from one another to vary the space therebetween to control the quantity of material delivered onto said belt, means for driving said feed rollers and said belt, and means for holding said adjustable supports in a predetermined position of adjustment.

11. The combination with a material feed belt, of segment shaped supports mounted thereabove, bearings slidably adjustable on said supports, means for holding said bearings in a set position of adjustment on said supports, and material feed rollers supported in said bearings for governing the delivery of material onto said belt.

12. The combination with a material feed belt, of a plurality of roller feed devices, and slidable bearings therefor adjustable through curved paths toward and away from one another to permit the feed devices to control the delivery of material onto said belt.

In testimony whereof I have hereunto subscribed my name.

MILTON O. HAEGER.