Feb. 13, 1945. R. D. DELAMERE 2,369,540

CONVEYER FOR FILLING MACHINES

Filed Dec. 26, 1942

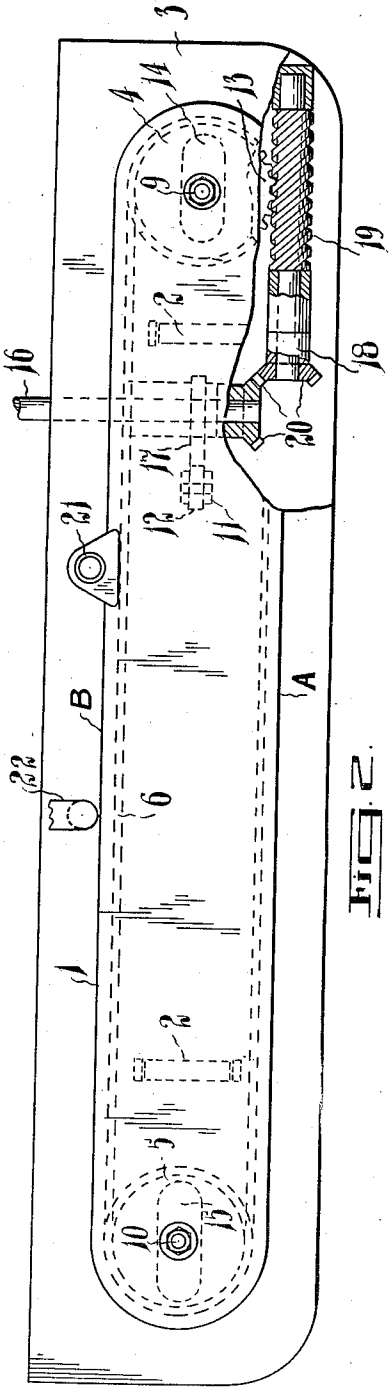


Fig. 2.

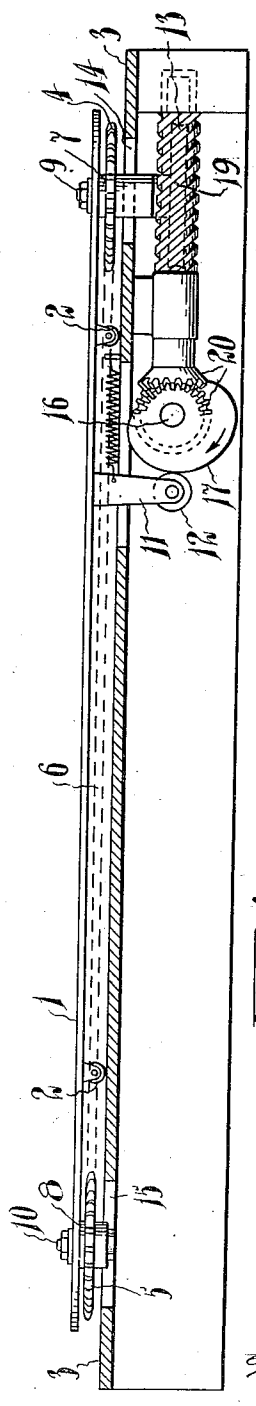


Fig. 1.

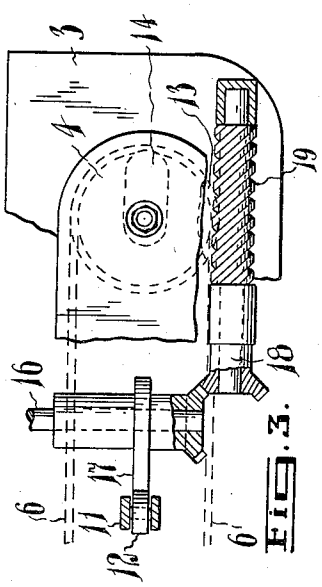


Fig. 3.

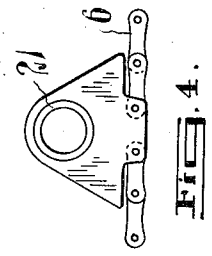


Fig. 4.

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CONVEYER FOR FILLING MACHINES

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7 Claims. (Cl. 226—95)

This invention relates to conveyers which may be used for conveying containers to filling means, and my object is to devise simple apparatus of this character which operates smoothly and quietly with a minimum of power, and which facilitates the replacement of fresh containers for those filled.

I attain my object by providing an endless conveyer having one portion thereof moving at a predetermined speed while the opposite portion moves intermittently or at varying speeds or in different directions.

The constructions are hereinafter more fully described and are illustrated, by way of example, in the accompanying drawing in which

Figure 1 is a side elevation, partly in section, of my invention;

Figure 2 a plan view thereof;

Figure 3 a detail in plan, partly broken away; showing the right hand end of Figure 2 in a different position; and

Figure 4 a detail of a few links of the conveyer showing a receptacle attached thereto for carrying a container.

In the drawing like numerals of reference indicate corresponding parts in the different figures.

1 is a frame or plate having anti-friction rollers 2 for running on a bed 3 of a packaging or filling machine. At opposite ends of the frame 1 are journalled sprockets 4, 5 around which an endless flexible conveying member such as a chain 6 is passed. Preferably the sprockets are formed on hubs 7, 8 which are journalled on studs 9, 10 secured to the frame 1. The latter is also provided with a depending bracket 11 on which is journalled an anti-friction roller 12. On the hub 7 is secured a spiral gear or worm wheel 13 having a pitch diameter equal to the pitch diameter of the sprocket 4.

Slots 14, 15 are formed in the bed 3 to guide the hubs 7, 8 as they are moved longitudinally of the bed as hereinafter described. A clearance slot for the bracket 11 is also provided in the bed. A constantly driven shaft 16 extending transversely of the bed 3 is journalled on the underside thereof. This shaft carries a cam 17 for engaging the roller 12 on the bracket 11 to reciprocate the frame 1, and thus the studs 9 and 10, the hubs 7 and 8, the sprockets 4 and 5, and the spiral gear or worm wheel 13, longitudinally on the bed 3. On the bed is suitably journalled a spindle 18 which carries a spiral pinion or worm 19 which is meshed with the spiral gear or worm wheel 13 to drive the sprocket 4 while the frame 1 and the above mentioned parts carried thereby are reciprocated by the cam. The spindle 18 is driven by bevel gearing 20 from the shaft 16. Any suitable means such as an electric motor (not shown) may be employed to drive the shaft 16 continuously. The length of the spiral pinion 19 is such that the spiral gear 13, when moved with the frame 1 will not be moved out of engagement therewith.

With the above construction having the pitch diameters of the spiral gear or worm wheel 13 and the sprocket 4 identical, the velocity of the portion of the chain 6 at the near side A of the frame 1 is always equal to the axial pitch speed of the worm and the said near portion of the chain moves in the same direction as that of the helix or helices of the worm.

Assuming the worm 19 is stationary and the frame 1, with the stud 9 carried thereby, is moved to the right or left, the portion of the chain at the near side A of the frame would remain stationary (as the worm is stationary) and the other portion of the chain at the rear side B of the frame would move in the same direction as the frame and stud but at twice the speed of the frame and stud became the worm wheel 13 rolls along the worm 19.

Assuming the frame 1 and stud 9 are stationary and the worm 19 is rotated, the speed of the portion of the chain at the rear side B of the frame is equal to that portion of the chain at the near side A of the frame, but in the opposite direction.

From the above it follows that if the worm 19 is rotated and the frame 1 and stud 9 are moved to the right or left, the velocity of the portion of the chain 6 at the rear side B of the frame is the algebraic sum of the velocity caused by the worm 19 and the velocity caused by the movement of the frame 1. In the following example all velocities to the left are termed "plus" and those to the right are termed "minus."

Example.—Assuming the frame 1 and thus the studs 9 and 10 carried thereby are stationary and that the worm 19 causes a velocity of plus two feet per second on the rear portion of the chain 6, then, if the frame 1 with its studs 9, 10 be moved at one foot per second to the right, a speed of minus two feet per second would be superimposed on the velocity of the rear portion of the chain whereby the rear portion of the chain would become stationary. If the frame 1 with its studs 9, 10 be moved at one foot per second to the left, the portion of the chain at the rear side B of the frame would have a speed super-

imposed thereon of plus two feet per second whereby the rear portion of the chain would travel at four feet per second. Since the cam 17 continuously reciprocates the frame 1 and stud 9, the portion of the chain at the rear side B of the frame 1 is alternately stopped and speeded up relative to the constant speed of the portion of the chain at the near side A of the frame.

In other words, the speed of the portion of the chain at the near side A of the frame 1 always equals the axial pitch speed of the worm and therefore is moved continuously at a constant speed while the speed of the portion of the chain at the rear side B of the frame is moved at varying speeds.

The conveying mechanism is particularly adapted for use with a machine for filling tooth paste or shaving cream tubes which are carried by pockets 21 secured to certain of the links of the chain 6. The tubes to be filled are advanced and brought to rest one by one at a filling spout 22 at the rear side B of the frame 1. The filled tubes are manually removed from the pockets and fresh tubes are inserted therein at the near side A. The filled tubes are thus replaced while the pockets 21 are continuously in motion which, it has been found, is easier for the operator to accomplish than if the pockets were stopped for this purpose.

The above mentioned filling machine may also be provided with means for closing the filled tubes in a series of steps as the said filled tubes are brought to rest along the rear side B.

By changing the shape of the cam 17 to vary the rate of speed of the frame 1 relative to that of the chain 6, the rate of speed of the rear portion thereof would be varied. That is to say, the shape of the cam in the drawing is such that the frame 1 is moved at half the speed of the front portion of the chain whereby the back portion of the chain is brought to rest during the movement of the frame in one direction. If the shape of the cam is changed to cause the frame 1 to move at less than half the speed of the front portion of the chain, the back portion thereof will be slowed down instead of being stopped. If the shape of the cam is changed to cause the frame 1 to be moved at more than half the speed of the front portion of the chain, the back portion thereof will be reversed.

If the pitch diameters of the spiral gear or worm wheel 13 and sprocket 4 be unequal, various other changes of speeds of both sides of the chain can be produced.

It is obvious that various modifications might be made without departing from the spirit of this invention.

What I claim as my invention is:

1. A conveyer comprising a reciprocable frame; rotatable members journalled on said frame in spaced relationship to one another; an endless flexible conveying member passed round said rotatable members; means for reciprocating the frame; and constantly driven means for driving one of said rotatable members while the frame is being reciprocated.

2. Conveying mechanism comprising a reciprocable frame; sprockets journalled on said frame in spaced relationship to one another; a chain conveyer meshed with the sprockets; means for reciprocating the frame; a spiral gear carried by one of the sprockets; and a constantly driven spiral pinion meshed with the spiral gear, the length of the pinion being sufficient to permit the gear to travel back and forth thereon as the frame is reciprocated.

3. Mechanism of the class described comprising filling means; means for advancing containers to the filling means, the said advancing means including a reciprocable frame and an endless flexible member rotatably supported on said frame; means for reciprocating said frame; and continuously operated means for driving said member while the frame is being reciprocated so that the containers on one side of the member are brought seriatum to rest at the filling means and the containers on the other side of the member are continuously in motion.

4. Conveying mechanism comprising a fixed bed; a reciprocable frame thereon; an endless flexible member rotatably supported on said frame; a constantly driven shaft arranged transversely of the frame; a spiral pinion arranged longitudinally of the frame and driven by said shaft; a spiral gear carried by the frame and meshed with the pinion for driving the flexible member; and a cam secured to said shaft for reciprocating the frame to cause the spiral gear to travel back and forth along the pinion so that the portion of the flexible member along one side of the frame is continuously operated while the speed of the portion of the flexible member along the other side of the frame is varied relative to the fixed bed.

5. Conveying mechanism comprising a reciprocable frame; sprockets journalled on said frame in spaced relationship to one another; a chain conveyer meshed with the sprockets; a constantly driven shaft arranged transversely of the frame; a spiral pinion arranged longitudinally of the frame and driven by said shaft; a spiral gear carried by one of the sprockets and meshed with the pinion for driving the chain; and a cam secured to said shaft for reciprocating the frame to cause the spiral gear to travel back and forth along the spiral pinion.

6. Conveying mechanism comprising a reciprocable frame; rotatable members journalled on said frame in spaced relationship to one another; an endless flexible conveying member passed round said rotatable members; constantly driven means for driving one of said rotatable members; and means actuated by the constantly driven means for reciprocating the frame to operate the portion of the flexible member along one side of the frame continuously while the speed of the portion of the flexible member along the other side of the frame is varied relative to said constantly operated portion.

7. Mechanism of the class described comprising filling means; means for advancing containers to the filling means, the said advancing means including a reciprocable frame and an endless flexible member rotatably supported on said frame; means for reciprocating said frame; and continuously operated means for driving said member while the frame is being reciprocated so that the containers on one side of the member are brought seriatum to rest at the filling means.

RUDOLF D. DELAMERE.