O. EICK.

CONVEYER.

APPLICATION FILED NOV. 23, 1911.

1,196,442.

Patented Aug. 29, 1916.

3 SHEETS—SHEET 1.

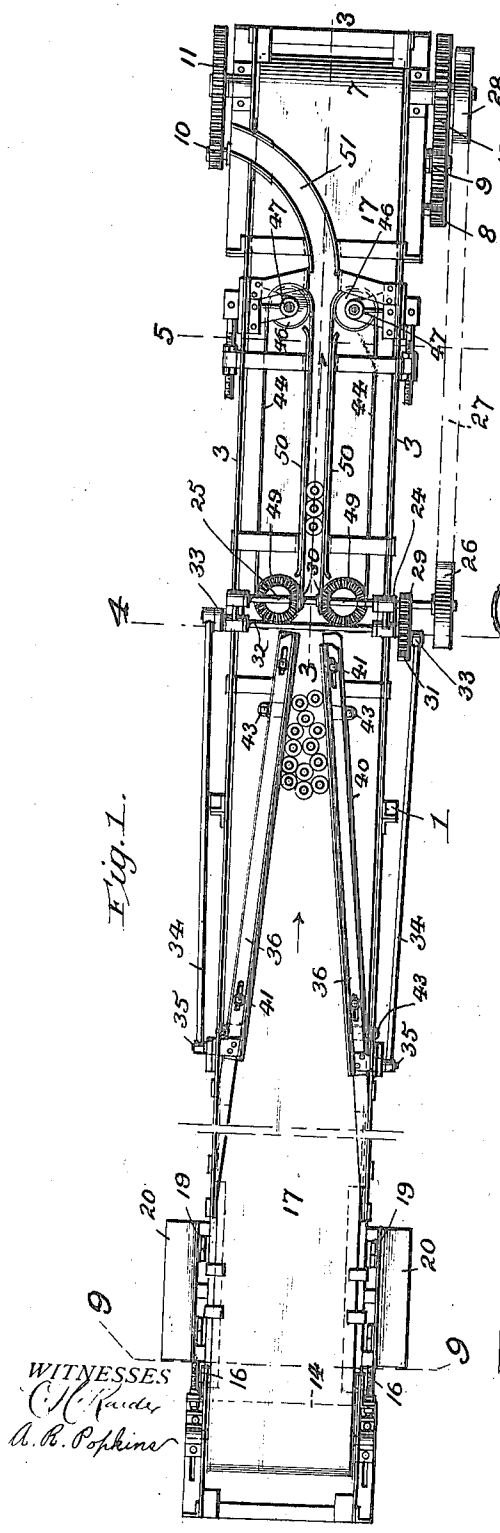


Fig. 1.

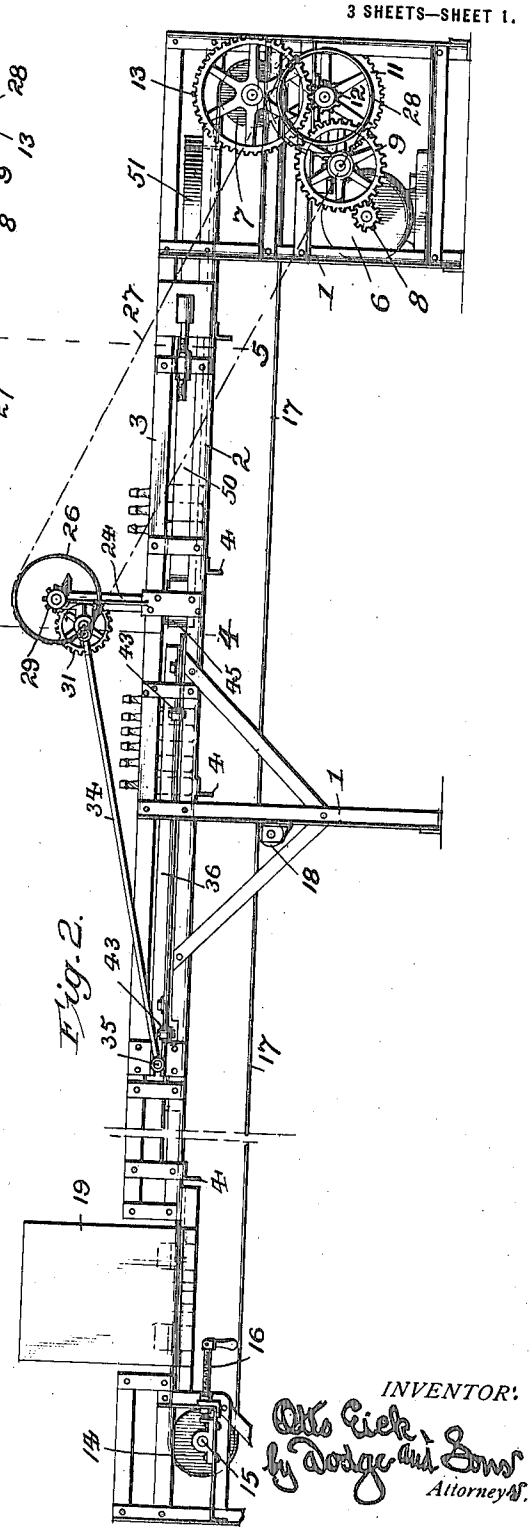


Fig. 2.

WITNESSES

C. J. Fowler

A. R. Popkins

INVENTOR:

Otto Eick

by Dodge and Sons

Attorneys.

O. EICK.

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3 SHEETS—SHEET 2.

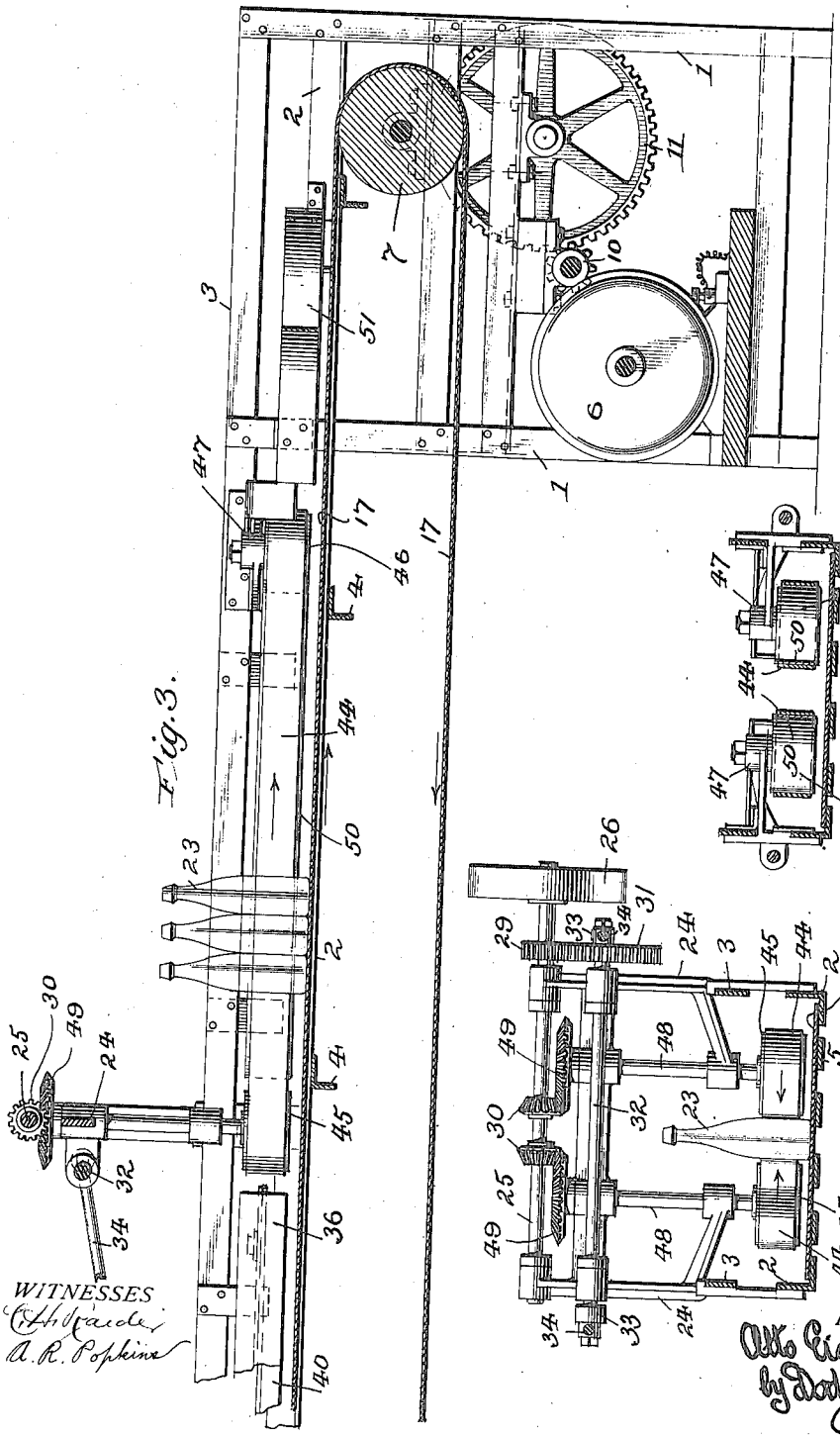


Fig. 3.

Fig. 5.

Fig. 4.

WITNESSES

A. R. Popkins

INVENTOR:

Otto Eick

by Dodge and Sons

Attorneys.

O. EICK.

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3 SHEETS—SHEET 3.

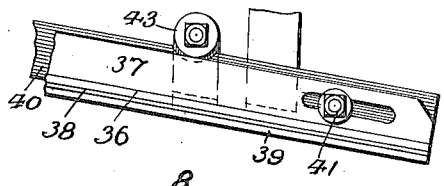
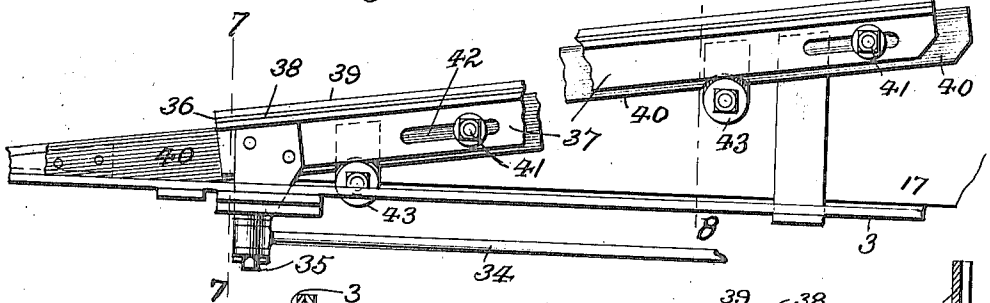


Fig. 6.



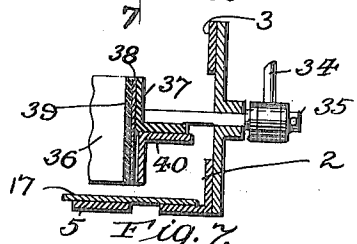


Fig. 7.

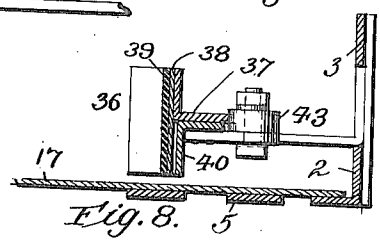


Fig. 8.

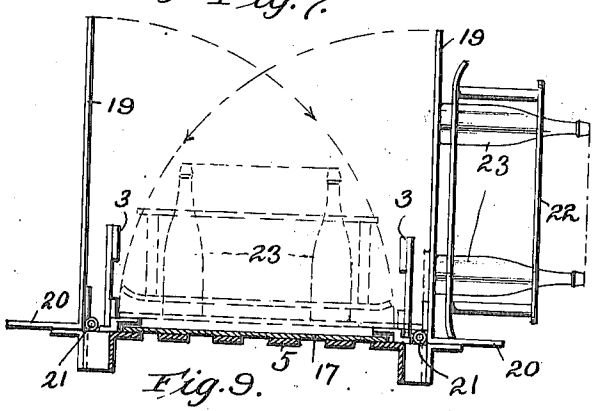


Fig. 9.

WITNESSES

A. J. Kaeder

A. R. Popkins

INVENTOR

Otto Eick

by Dodge and Sons

Attorneys

UNITED STATES PATENT OFFICE.

OTTO EICK, OF BALTIMORE, MARYLAND.

CONVEYER.

1,196,442. Specification of Letters Patent. Patented Aug. 29, 1916.

Application filed November 23, 1911. Serial No. 662,031.

To all whom it may concern:

Be it known that I, OTTO EICK, a citizen of the United States, residing at Baltimore, in the county of Baltimore and State of Maryland, have invented certain new and useful Improvements in Conveyers, of which the following is a specification.

This invention relates to conveyers, and particularly to a conveyer designed to receive bottles from crates or in large numbers and to discharge the same in single file in an upright position, ready to be fed to some other machine.

One field of utility of the device is in bottling works, where the conveyer may be used to receive bottles in crates from the bottle washing machine and to deliver the bottles discharged from the crates in single file at the appropriate rate of speed to the filling and corking devices.

A preferred embodiment of the invention will be described in connection with the accompanying drawings, wherein—

Figure 1 is a plan view of the complete device; Fig. 2 is a side elevation thereof; Fig. 3 is a longitudinal vertical section on an enlarged scale of the driving and discharge end of the conveyer on the line 3—3 of Fig. 1; Fig. 4 is a section on the line 4—4 of Fig. 1; Fig. 5 is a section on the line 5—5 of Fig. 1; Fig. 6 is a plan view of a portion of the agitator bars designed to show the mode of guiding these bars; Fig. 7 is a section on the line 7—7 of Fig. 6; Fig. 8 is a section on the line 8—8 of Fig. 6; and Fig. 9 is a section on the line 9—9 of Fig. 1.

The mechanism is supported on a frame work consisting of uprights 1, carrying longitudinal side bars 2 and 3, suitably tied together and braced to carry the necessary mechanism. The upper bars 3 are of bar iron or steel while the lower bars 2 are of angle section, the arms of the angles extending inward and assisting in supporting the conveyer belt as will later appear. The side bars 2 are further tied together by cross sills 4 upon which are fastened a number of longitudinal slats or bars 5 spaced short distances apart. These serve as a bed or support for the conveyer belt.

At one end of the machine is mounted an electric or other motor 6 which drives a conveyer belt pulley 7 through a reducing train of gears 8, 9, 10, 11, 12 and 13, whose size and the number of whose teeth is dependent upon the desired speed ratios, as will appear. At the opposite end of the machine is a second conveyer belt pulley 14, which is mounted in bearing boxes 15 longitudinally adjustable by means of the screw 16 to vary the tension on the conveyer belt 17. The upper run of the conveyer belt 17 rests upon the slats 5 and the inwardly extending flanges of the bars 2, while the lower run is supported on rollers 18. The various parts are usually so designed that the belt 17 has a lineal speed of approximately 25 feet per minute in the direction of the arrow in Fig. 1. The belt is preferably made of a rubber covered fabric to withstand the effects of water and abrasion.

At the left hand end of the machine, as viewed in Fig. 1, which is the receiving end, are located the devices for loading the bottles upon the conveyer shown in detail in Fig. 9. These consist of shelves 19 having flanges 20 extending at right angles therefrom, the shelves 19 being pivoted at 21 so as to swing down and overlie the belt. The bottles 23 generally come to the conveyer from the washing machine in crates of the general form illustrated at 22 (Fig. 9) and are placed upon the shelves 19 as illustrated in full lines in Fig. 9. The shelves with the bottles supported thereon are then swung down over the belt to the position shown in dotted lines in Fig. 9, and the crate 22 is then moved longitudinally in the direction of motion of the belt 17 until the bottles 23 contained in the crate rest upright upon the belt, whereupon the crate is lifted vertically away from the bottles and returned to the bottle washer. In this manner the bottles are placed upon the conveyer belt standing upright in groups and are fed by the belt toward the discharge end of the machine. In order to arrange the bottles in single file it is necessary to break up this grouped arrangement and to avoid any tendency for the bottles to jam together as they are moved toward their new arrangement. To accomplish this purpose, I make use of what I shall term agitator bars and a pair of feed belts which will now be described.

Connected to the bars 2 and 3 near the middle of the machine is an upright frame 24 which supports a cross shaft 25 carrying a pulley 26 which is driven by a belt 27 from a pulley 28. The pulley 28 is mounted on the countershaft with the gears 11 and 12.

Any equivalent drive might be substituted. The cross shaft 25 carries a spur gear 29 and a pair of bevel gears 30. The gear 29 meshes with a gear 31 carried on a second cross shaft 32 also supported on the frame 24 and carrying a pair of cranks 33. The cranks 33 are connected by rods 34 to journal pins 35 carried on the agitator bars 36. These bars consist preferably of an angle bar 37 carrying a vertical metal plate 38 faced with rubber 39. The agitator bars are supported throughout their entire length on bars 40 extending between the side bars and one of the cross sills or frames 4, the supporting members 40 and consequently the agitator bars, being arranged to converge in the direction of motion of the belt 17. The agitator bars thus serve to guide the advancing bottles to the middle of the belt and permit them to pass on one at a time. The agitator bars are held to their supports 40 by studs 41, which are fast in the supports 40 and extend through longitudinal slots 42 in the angle-bars 37, as clearly shown in Fig. 6. In this way the agitator bars are capable of a limited longitudinal movement. In order to reduce the friction which might be occasioned by the jamming of bottles between the awo agitator bars, roller bearings 43 are provided to receive this thrust and relieve the studs 41 thereof.

From the mechanism above described it will be observed that when the machine is in motion, the agitator bars 36 are given a longitudinal reciprocation and serve first to guide the bottles in a constantly narrowing path and second so to partially rotate or oscillate the bottles as they move toward the narrow end of the path as to facilitate their assuming their new arrangement. The two cranks 33 may be parallel or opposed, or arranged at any other angle as may be found desirable, the effect of changing such arrangement being to change the relative movements of the two agitator bars. The bottles are therefore discharged from the narrow end of the agitator bars in single file. Upon leaving the agitator bars the bottles are gripped by a pair of opposed belts 44. These belts are preferably of rubber coated fabric and are supported on driving pulleys 45 and idle pulleys 46 whose bearing boxes 47 are adjusted to vary the tension on the belt. The driving pulleys 45 are carried on vertical shafts 48 mounted in bearings in the frame 24 and are driven through bevel gears 49 by the bevel gears 30 heretofore mentioned.

As indicated in Fig. 1, the belts 44 are sustained by fixed backing strips 50 so that the belts shall maintain constant gripping action on the bottles passing between them. The belts 44 move at the same speed as the main conveyer belt 17 so that as fast as the bottles are discharged from the narrow space between the ends of the agitator bars they are gripped by the belts 44 and fed to the discharge end of the machine where they pass between guide ways 51 of any suitable form. The bottles as they pass between the belts 44 force the bottles that lie ahead of them out through the guide way 51 to a filling or other machine, or into suitable racks as may be preferred.

Briefly stated the machine may be said to consist of a main conveyer belt, a device for depositing the bottles upon the belt in an upright position, converging guides adapted to direct the bottles into a single-file arrangement, an agitator mechanism adapted to impart partial rotation or rotary oscillation to the bottles to cause them to free themselves from any cramping tendency while passing through the converging guides, so that they readily rearrange themselves as they move along on the conveyer belt, and a discharging feed device to force the bottles from the machine in their new single-file arrangement. The agitator device may assume forms varying somewhat from that shown, the essential feature being a capability of engaging and imparting a rotary motion or a rotary oscillation to the bottles as they pass through converging guides to cause them, without cramping, to assume the arrangement desired.

Having thus described my invention, what I claim is:

1. In a conveying mechanism, the combination of a suitable supporting frame; a longitudinally-movable conveyer supported thereby; an endwise movable guide mechanism mounted above said conveyer in the path of objects carried thereby, engaging and guiding said objects in a narrowing path while imparting an axial motion thereto; and means for actuating said conveyer and guide mechanism.

2. In a conveying mechanism, the combination of a suitable supporting frame; a longitudinally-movable conveyer supported thereby; a pair of guides converging in the direction of motion of said conveyer and mounted above the same in the path of objects carried thereby; a mechanism adapted to impart an axial motion to objects passing between said guides; and means for actuating said conveyer and mechanism.

3. In a conveying mechanism, the combination of a suitable supporting frame; a longitudinally-movable conveyer supported thereby and adapted to carry a plurality of objects abreast; a pair of guide bars converging in the direction of motion of said conveyer and mounted to reciprocate in the direction of their length above the conveyer in the path of the objects carried thereby; and means for actuating said conveyer and bars.

4. In a conveying mechanism, the combination of a suitable supporting frame; a longitudinally-movable conveyer supported thereby and adapted to convey a plurality of objects abreast; a pair of guide-bars converging in the direction of motion of said conveyer, and mounted to reciprocate in the direction of their length above the conveyer in the path of the objects carried thereby; a pair of oppositely-disposed gripping belts also mounted above the conveyer and adapted to receive between them and engage objects discharged from said guide bars and to maintain them in the order in which they are received from the guide-bars; and means for actuating said conveyer, guide bars and gripping belts.

5. In a conveying mechanism, the combination of a supporting frame; a longitudinally-movable conveyer carried thereby and adapted to convey a plurality of objects abreast; a pair of oppositely-disposed and converging bars located above the conveyer; and means for moving said bars endwise in opposition to each other, whereby bottles or the like placed upon the conveyer in bulk or abreast will be moved between the converging bars and by said bars placed in single file at the discharge end thereof.

6. In a conveying mechanism, the combination of a suitable supporting frame; a conveyer belt movable thereover; a pair of guide-bars located above the frame and converging in the direction of movement of the belt; means for reciprocating said bars endwise; and a friction face applied to each bar, whereby bottles or the like placed upon the belt will be carried between the guide-bars and subjected to the motion of the bars, the bottles thereby being brought into single file at the discharge end of the bars.

7. In a conveying mechanism, the combination of a frame; an endless conveyer belt movable thereover; a converging runway located adjacent one end of the belt and comprising a pair of endwise-reciprocable bars; and a pair of oppositely-disposed belts spaced apart a distance equal to the space between the converging ends of the bars, and adjacent thereto, said belts being likewise located above the endless conveyer belt and adapted to receive articles delivered from the runway and to maintain them in single file.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

OTTO EICK.

Witnesses:
J. A. VALENTIN SCHMIDT,
EDW. H. RARSFELD.