

Jan. 10, 1950

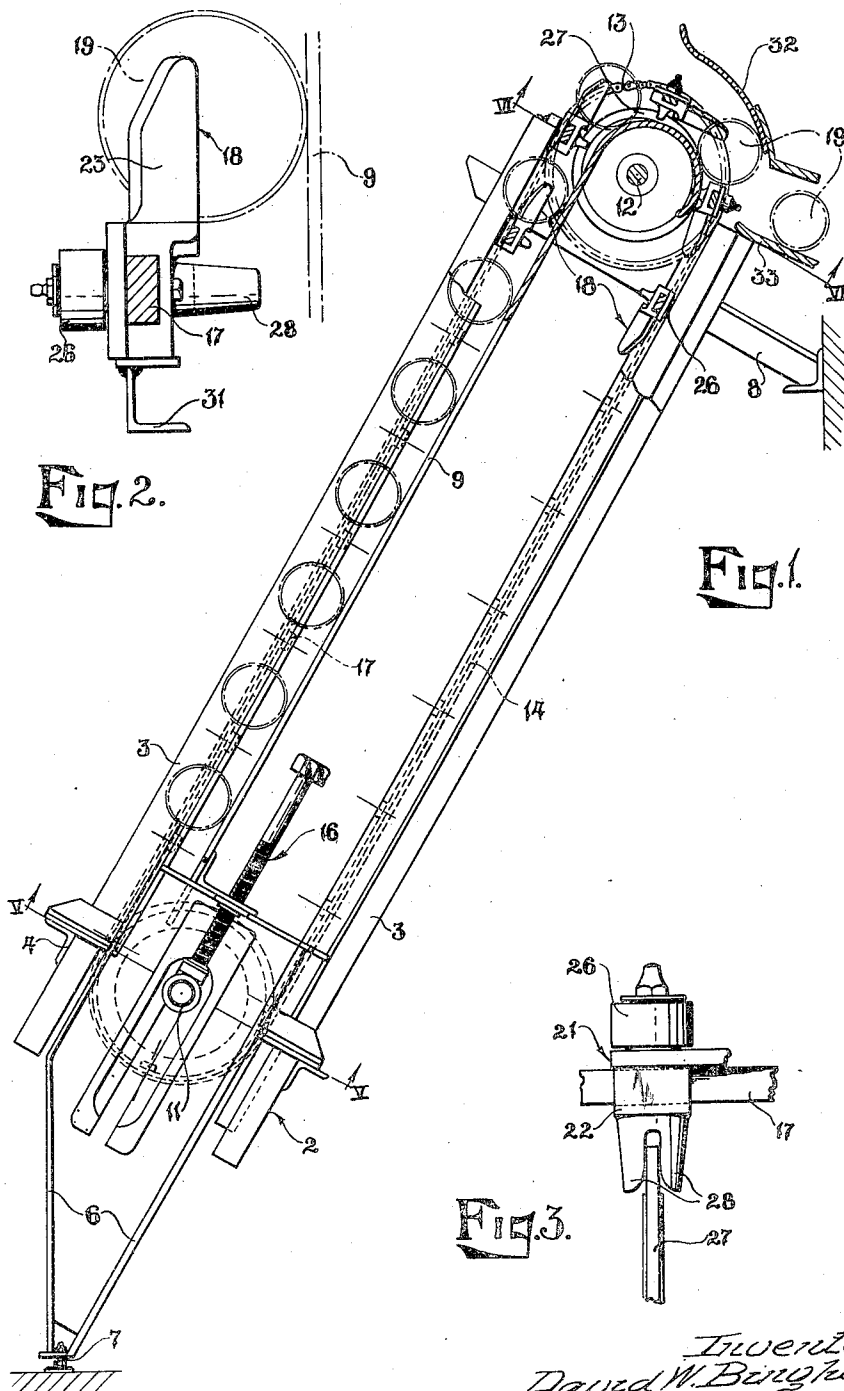
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2,493,942

ELEVATOR AND CONVEYER FOR CYLINDRICAL ARTICLES

Filed May 15, 1948

2 Sheets-Sheet 1



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Fig. 4.

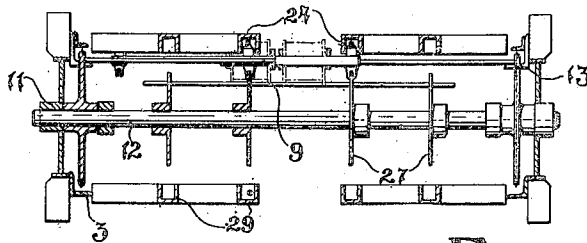
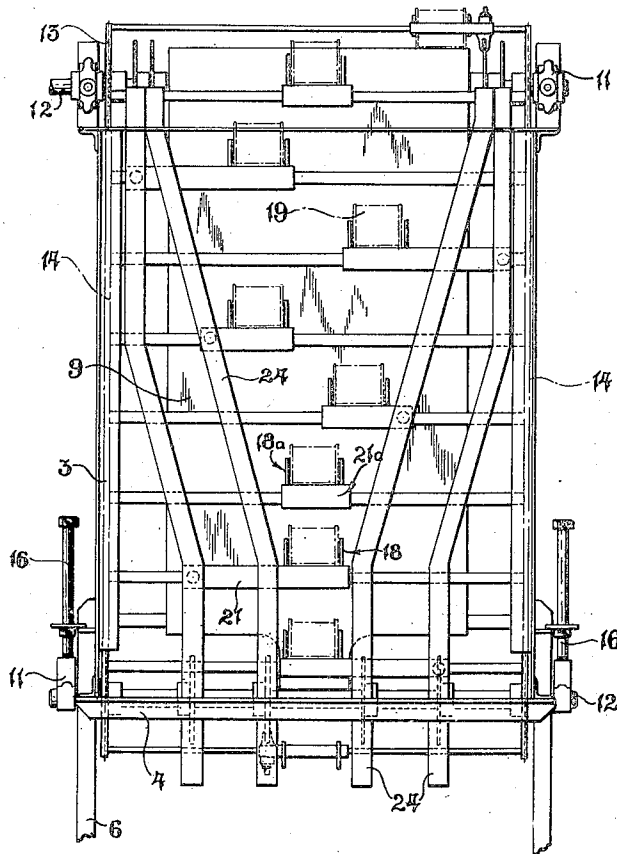


Fig. 5.

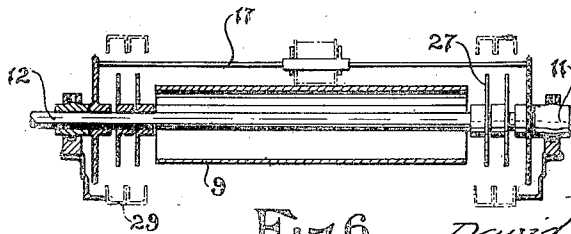


Fig. 6.

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UNITED STATES PATENT OFFICE

2,493,942

ELEVATOR AND CONVEYER FOR
CYLINDRICAL ARTICLESDavid William Bingham, Brighton, Victoria,
AustraliaApplication May 15, 1948, Serial No. 27,564
In Australia May 16, 1947

7 Claims. (Cl. 198—30)

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This invention relates to elevators, conveyors and the like of the type which are adapted to handle food cans and other cylindrical articles. More particularly the invention concerns such elevators which are adapted to receive cans being fed forward in single file and automatically to separate such cans into a series of laterally spaced files so that they may be delivered into associated apparatus such for example as mechanical cookers, coolers or labelling machines.

Hitherto conveyors or elevators of the kind indicated have not proved to be entirely satisfactory in that the cans, which were handled on their ends, were not under sufficient control to efficiently synchronize their forward movement with the conveyors or the like in the associated cooking or like apparatus.

The primary object of the present invention is to provide an improved elevator or conveyor of the kind indicated in which provision is made for rolling the cans or the like throughout their forward movement, and also whilst they are being separated into the series of laterally spaced files whereby most effective control and timing of the forward movement of the cans is maintained and it is possible to readily synchronize the delivery of the cans in accordance with the requirements of the associated cooking or other apparatus.

Various other objects and novel constructional features of the invention will be more readily apparent from the following description of one practical embodiment.

Referring to the drawings which form part of this specification:

Figure 1 is a side elevation of an elevator or conveyor in accordance with one embodiment of the present invention.

Figure 2 is an enlarged side elevation of one of the can holders and its carriage seen in Figure 1.

Figure 3 is a rear view of part of the can holder seen in Figure 2.

Figure 4 is a front elevation of Figure 1.

Figure 5 is a cross section taken on the line V—V of Figure 1.

Figure 6 is a cross section taken on the line VI—VI of Figure 1.

Apparatus in accordance with the present invention includes a supporting frame 2 which may be of substantially rectangular formation and consist of a plurality of spaced longitudinal and transverse frame members 3 and 4 respectively connected together by welding or in any other suitable manner.

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In some instances the improved elevator or conveyor may be adapted for mounting in an upstanding or inclined attitude as in Fig. 1 of the drawings and for this purpose its supporting frame is provided with mounting means which may consist of a plurality of depending legs 6 adapted to be connected to anchoring posts 7 in a concrete foundation or any other suitable support. The supporting frame may also be provided with a plurality of forwardly extending arms 8 adapted to rest against the frame of an associated machine or other convenient support so that the supporting frame 2 may be operatively positioned in the desired inclined attitude.

The supporting frame carries a table or platform 9 having a substantially flat surface which is located adjacent to the front of the frame and extends lengthwise thereof. The width of the table is such as to accommodate all of the several laterally spaced paths traversed by a series of can holders as hereinabove described.

Located at or adjacent to the opposite ends of the frame are coaligned bearings 11 for a pair of transverse shafts 12, one at each end of the frame. Each of these shafts is provided near its opposite ends with sprockets 13 for a pair of endless conveyor elements such as chains 14 which are arranged, one at each side of the supporting frame so as to pass around the aligned sprockets on the shafts.

One of these shafts is adapted to be power driven whilst the other may be relatively movable towards and away from the companion shaft so as to adjust the tension of the chains. Screw and nut tensioning devices 16 or any other suitable means may be provided for effecting such movement of the adjustable shaft.

The pair of endless conveyor chains are adapted to carry a series of cross members such as bars or the like 17, which are longitudinally spaced in substantially parallel relationship on the chains. Each of these cross bars is fitted with a holder 18 for one of the food cans or other cylindrical articles 19 to be handled.

Each of these holders is preferably mounted on a carriage 21 which is longitudinally slidable on its cross bar. This carriage may consist of a sleeve or any other suitable support 22 which is capable of sliding freely along the associated cross bar.

Each of the can holders may consist of a pair of forwardly projecting arms 23 which are laterally spaced for a predetermined distance and fixed at their inner ends to their carriage. As

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seen more clearly in Figs. 2 and 4 of the drawings, the can holder or its carriage is adapted to engage one side of the can and roll it forward. If desired, these arms may be relatively adjustable towards and away from each other so as to accommodate cans of different sizes.

In combination with the foregoing are means for automatically moving the can holders laterally for example by moving the carriages 21 lengthwise of their cross bars in a sideward direction as the carriages are moving forward over the table 9. For this purpose a series of laterally spaced guideways such as open ended guide channels 24 may be employed. As seen in Figs. 1, 4 and 5 of the drawings, the latter may be of substantially inverted U shape in cross section and carried by some of the supporting frame members in such a manner that the channels are positioned above both the table 9 and the series of carriages 21 with the channels extending lengthwise of the supporting frame.

At the feeding end of the supporting frame the series of channels 24 are arranged in substantially parallel, spaced formation but after extending forward for a suitable distance, the channels diverge towards the opposite sides of the frame and finally again extend forward in substantially parallel spaced relationship at or adjacent to the discharge end of the frame as in Fig. 4.

Each of these open ended channels 24 is adapted to accommodate an anti-friction roller 26 or any other suitable projection on one of the aforesaid carriages so that as the latter moves forward with the endless chains its roller passes along the inclined portion of its channel and thus automatically moves its carriage sidewardly to a predetermined position as the carriage approaches the discharge end of the frame.

Means are provided for directing the can holders along a central path at the feeding end of the apparatus and also for subsequently varying their degree of lateral movement as they continue to move forward. For this purpose, the carriages 21 may vary in length in such a manner that when their rollers are traversing the parallel portions of the guideways at the feeding end of the apparatus, each can holder 18 follows a path extending centrally along the supporting frame, the arrangement being such that the can holders follow each other in longitudinally spaced alignment until their rollers 26 enter the inclined portions of their guide channels and commence to move the holders automatically towards the sides of the supporting frame. The carriage 21a on one of the cross bars 17 is preferably fixed in position so that its can holder 18a may continue to move forward along the central path throughout the length of the machine. This carriage is of course devoid of an anti-friction roller and associated channel.

As the rollers leave the discharge ends of the channels 24 it is necessary to retain the various can holders 18 in the desired laterally spaced relationship until the cans have been discharged and the carriages have commenced a return movement along the back of the supporting frame. For this purpose guide means are provided at opposite ends of the machine and said guide means may include a series of discs 27 arranged in laterally spaced formation on each of the aforesaid transverse shafts 12.

Each of these discs is adapted to be engaged by a pair of spaced lips 28 on one of the carriages, the arrangement being such that the carriages

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are retained in the desired spaced relationship as they are carried around the sprockets at the opposite ends of the apparatus.

Means are also provided for returning the carriages to their original positions as they travel along the back of the supporting frame towards the feeding end of the apparatus. Said returning means may consist of a second set of open ended channels 29 mounted on the back of the supporting frame in substantial alignment with those on the front of the frame.

In use, the cans of like cylindrical articles 19 are fed in single file to the can holders 18, 18a as they also move forward in single file along the central path at the feeding end of the apparatus. The movements are synchronized so that each of the holders receives one can only. As the can holders continue to move forward the cans roll along the flat table 9 and continue to roll freely even when their holders commence to move sidewardly as aforesaid. The length of the various carriages for the holders varies so that the cans may be finally positioned and carried forward along parallel paths in the desired laterally spaced relationship. During the whole of such movements the positions of the cans are effectively controlled and friction is reduced to a minimum as the cans continue to roll until they are finally discharged from the elevator.

If desired, suitable sized spacing members 31 may be arranged behind each of the aforesaid carriages 21 so as to prevent more than one can entering the space between adjacent can holders when they are moving forward at the feeding end of the machine in single file.

One or more arcuate guide plates 32 which are preferably adjustable and/or a chute or the like 33 may be provided at the discharge end of the apparatus to guide the cans as they pass from the elevator into the associated cooking or other apparatus.

Various alterations, modifications and/or additions may be introduced into the foregoing construction and arrangement of parts without departing from the ambit of the invention as defined by the appended claims.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

1. An improved elevator or conveyor of the kind indicated comprising a supporting frame carrying a table having a substantially flat surface extending lengthwise of the supporting frame and of sufficient width to include the several paths of all of the cans or like cylindrical articles being handled, endless conveyor elements located one at each side of said table and carrying a series of longitudinally spaced can holders for rolling said cans forward over the table, means for directing each said can holder in succession along a central path at the feeding end of the apparatus, means for automatically moving said can holders laterally either in a left or right hand direction and for varying the degree of lateral movement of adjacent can holders so that adjacent cans finally move forward along laterally spaced paths which are out of longitudinal alignment for the purpose specified.

2. Apparatus according to claim 1 wherein said means for effecting lateral movement of said can holders includes a plurality of laterally spaced guideways or channels each of which is adapted to be engaged by one of said can holders, said guideways being carried by the supporting frame

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above and spaced from the flat surface of said table and being arranged in substantially parallel spaced formation at both the feeding and discharge ends of the apparatus with the parallel opposite end portions of said guideways interconnected by intermediate inclined portions which diverge sidewardly from the feeding towards the discharge ends of the apparatus and means for returning said can holders to their original operative positions as they are carried along the back of the apparatus towards the feeding end thereon, said returning means including a second series of open ended guide channels mounted upon the back of said supporting frame and in substantial alignment with the channels on the front of the apparatus for the purpose specified.

3. Apparatus according to claim 1 wherein said means for effecting lateral movement of said can holders includes a plurality of laterally spaced guideways or channels each of which is adapted to be engaged by one of said can holders, said guideways being carried by the supporting frame above and spaced from the flat surface of said table and being arranged in substantially parallel spaced formation at both the feeding and discharge ends of the apparatus with the parallel opposite end portions of said guideways interconnected by intermediate inclined portions which diverge sidewardly from the feeding towards the discharge ends of the apparatus and means for returning said can holders to their original operative positions as they are carried along the back of the apparatus towards the feeding end thereon, said returning means including a second series of open ended guide channels mounted upon the back of said supporting frame and in substantial alignment with the channels on the front of the apparatus and guide means for retaining said can holders in the desired laterally spaced relationship whilst they are passing at opposite ends of the apparatus between the open ended channels at the front and rear of said table for the purpose specified.

4. Apparatus according to claim 1 wherein said means for effecting lateral movement of said can holders includes a plurality of laterally spaced guideways or channels each of which is adapted to be engaged by one of said can holders, said guideways being carried by the supporting frame above and spaced from the flat surface of said table and being arranged in substantially parallel spaced formation at both the feeding and discharge ends of the apparatus with the parallel opposite end portions of said guideways interconnected by intermediate inclined portions which diverge sidewardly from the feeding towards the discharge ends of the apparatus and means for returning said can holders to their original operative positions as they are carried along the back of the apparatus towards the feeding end thereon, said returning means including a second series of open ended guide channels mounted upon the back of said supporting frame and in substantial alignment with the channels on the front of the apparatus and guide

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means for retaining said can holders in the desired laterally spaced relationship whilst they are passing at opposite ends of the apparatus between the open ended channels at the front and rear of said table, said guide means at opposite ends of the apparatus including a plurality of rotatable discs arranged in laterally spaced formation on a transverse shaft, each of said discs being adapted to be engaged by a pair of spaced lips on one of said can holders so as to temporarily retain the latter in the desired operative position until it is again engaged by one of said open ended channels on the opposite side of the apparatus for the purpose specified.

5. Apparatus according to claim 1 wherein said supporting frame is of substantially rectangular formation and consists of a plurality of spaced longitudinal and transverse frame members connected together so that the frame may be inclined upwardly and forwardly when in its operative position, the flat surface of said table being positioned adjacent to the front of said frame which is provided adjacent to its opposite ends with bearings for transverse shafts located one at each end of the frame and fitted with co-aligned sprockets adapted to receive a pair of endless conveyor chains located one at each side of said frame and carrying a plurality of longitudinally spaced cross bars on which said can holders are slidably mounted for the purpose specified.

6. An improved elevator or conveyor of the kind indicated comprising a supporting frame carrying a table having a substantially flat surface extending lengthwise of said frame and being of sufficient width to include the paths of all cans or like cylindrical articles being handled, endless conveyor elements located one at each side of said table and carrying a series of longitudinally spaced cross members each of which supports a can holder which is slidable lengthwise on its cross member, means for automatically moving some of said can holders lengthwise on their cross members as the can holders are carried forward over the table, and for varying said lengthwise movement of adjacent can holders so that they eventually move forward along laterally spaced parallel paths which are out of longitudinal alignment for the purpose specified.

7. Apparatus according to claim 5, wherein the can holder on one or more of said cross members is fixed in a central position thereon so that it does not move laterally as it is carried forward over said table but continues to follow the central path throughout the length of the apparatus for the purpose specified.

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The following references are of record in the file of this patent:

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