Aug. 1, 1939. C. N. BERGMANN 2,168,191

CONTAINER CONVEYER AND DISTRIBUTOR

Filed Oct. 29, 1938 2 Sheets-Sheet 1

Fig. 1.

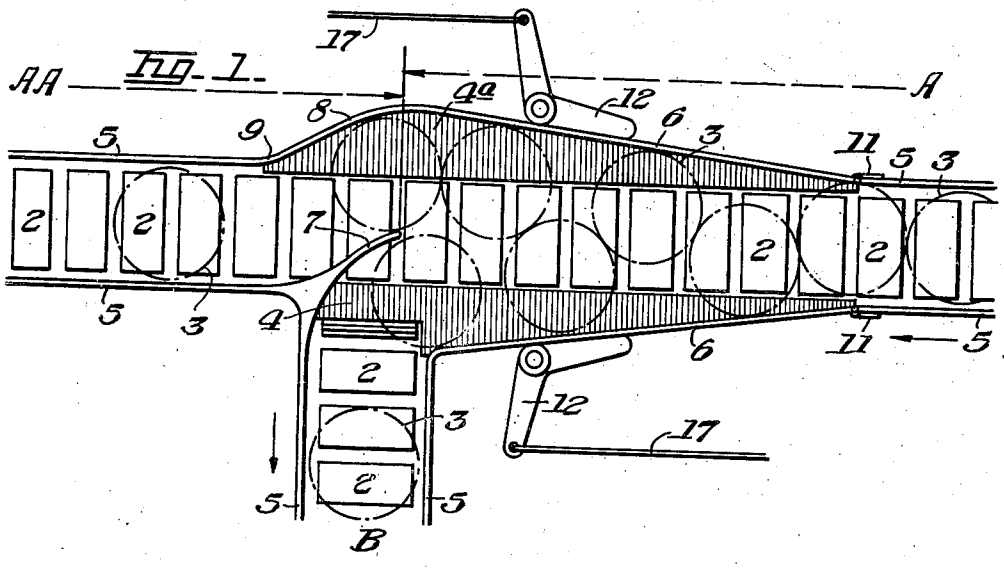


Fig. 2.

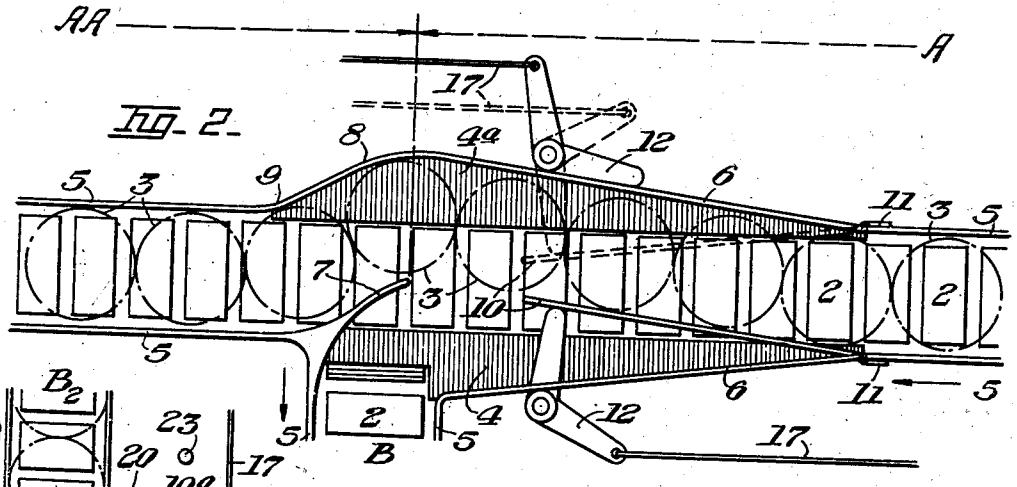


Fig. 7.

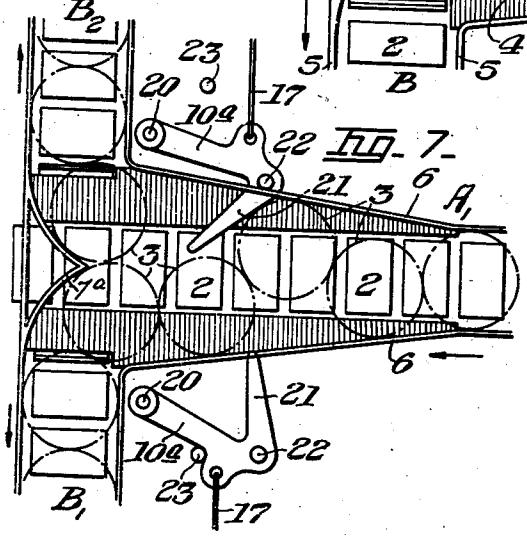
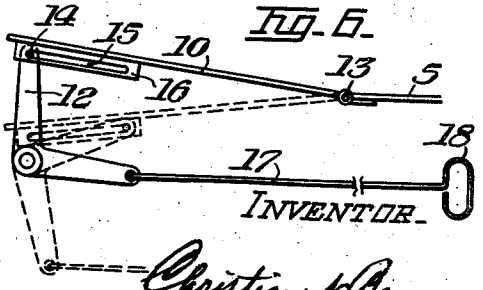


Fig. 6.



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CONTAINER CONVEYER AND DISTRIBUTOR

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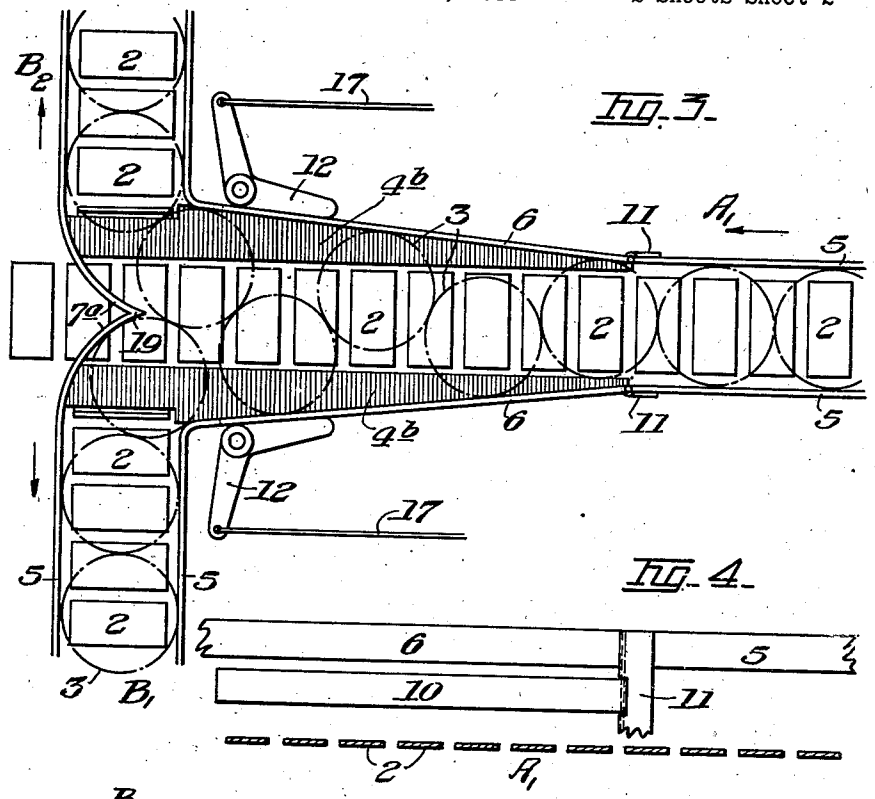

Fig. 3.

Fig. 4.

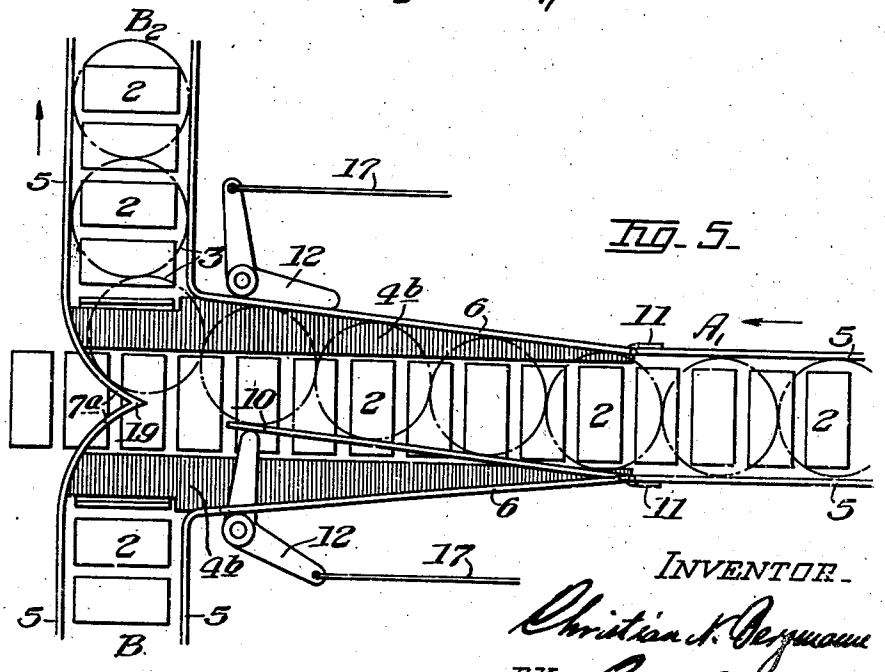

Fig. 5.

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Patented Aug. 1, 1939

2,168,191

UNITED STATES PATENT OFFICE

2,168,191

CONTAINER CONVEYER AND DISTRIBUTOR

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Application October 29, 1938, Serial No. 237,684

16 Claims. (Cl. 198—81)

My invention is an improvement in distributing conveyers for containers such as bottles, cans, or the like.

It is particularly adapted to the art of conveying cylindrical units, as milk bottles, from a single supply source to a plurality, as two, delivery destinations or stations, by distributing a single row or stream of such units by plural supply or delivery conveyers.

The invention has in view to accomplish such distribution automatically by means of a single, or substantially single, main conveyer and one or more laterally disposed branch conveyers communicating therewith, whereby a main conveyer extension and a lateral conveyer, or two such, are both operative to carry to two final delivery or receiving stations portions only of the primary or initial supply row or stream, or by selected diversion, the full load to either of such stations.

The invention provides for distribution by and from a main conveyer to a plurality, as two, of delivery conveyers leading to corresponding receiving stations.

I accomplish these objects by so combining with the main conveyer one, or a plurality, of branch distributing or delivery conveyers having junction relation with the main conveyer, with transfer assisting and guiding means effecting appropriate and desired selectivity of the units from the main row, for movement along either or both of the delivery paths.

In the construction of my invention I utilize main and supplemental conveyers of the general type of those disclosed in my prior Patent Nos. 2,103,107 and 2,108,522, but dispensing with the star wheels of the latter, or as shown in pending application Ser. No. 199,139.

The particular object in view is to provide, in connection with directing guide rails, supplemental adjustable guides adapted to direct or switch the units of a single oncoming column towards one or the other of a plurality, as two, delivery conveyers, one or both of which may be lateral of the main conveyer.

In the drawings illustrating different embodiments of the invention, in somewhat diagrammatic form:

Fig. 1 is a plan view showing the junction with a longitudinal main conveyer, of a lateral conveyer provided with controlling deflecting or switching means in receded position for both straight and lateral distribution;

Fig. 2 is a similar view showing the switching member adjusted for direct distribution of units and preventing feed to the lateral conveyer;

Fig. 3 is a similar view showing oppositely disposed lateral conveyers leading off from a main conveyer at each side;

Fig. 4 is a detail view in side elevation illustrating a portion of the fixed guide rail and the adjustable shifting or switching arm at one side of the conveyer;

Fig. 5 is a view like Fig. 3 showing the adjustable shifting arm thrust inwardly at one side;

Fig. 6 is a detail view showing positive connection between the shifting arm and its actuating lever.

Fig. 7 is a detail view of a modified form of switch.

The drawings illustrate two constructions which may be utilized for solution of the problem of distributing the normal output of a single element, as a washing machine, to a plurality of subsequent stations and operations, as in filling the bottles or containers.

In the construction of Figs. 1 and 2 I provide for continuous successive movement of all the units of a main column, or for partial deflection thereof to a secondary branch or lateral conveyer, as required.

In such arrangement the main trackway A, of conventional form, consists of a continuous line of flat top conveyer flights 2 having the usual flexibly connected supporting links, carried and driven by standard sprockets and power imparting means, not necessarily herein described.

The flights of both conveyers, running at any selected speed, and preferably with the main conveyer at faster speed than the lateral conveyer or conveyers, are adapted to support the bottles or other cylindrical units 3 along and through the several trackways.

The lateral trackway B, of similar conveyer flights 2, has its receiving end terminating as closely adjacent the side of the main conveyer as practicable, preferably with an intervening bridge plate 4 of suitable construction, on a common level with both.

The trackway of the main conveyer A is defined between flanking guide rails 5 at each side, extending sufficiently above the flights for maintaining the units in line of progress, with suitable clearance and free movement, and allowance for necessary slippage arising from incidental retardation.

Likewise the trackway B has similar guide rails 5 in outer embracing and guiding relation to the units and at each side of the flights 2 thereof, as shown.

Such lateral guide rails are connected with and form extensions of the adjacent guide rails 5 of the main trackway, with diverging space widening extensions 6 at each side towards the junction with trackway B. By such divergence the width of the trackway is increased sufficiently to allow ample clearance for passage of units to the lateral trackway and also outwardly around and opposite to its junction therewith, for such units as are temporarily deflected from the straight trackway A.

By such arrangement that portion AA of the main trackway conveyer A beyond the junction constitutes in effect one of the pair of delivery conveyer sections. Such sections therefore may distribute units beyond the junction in varying diverging paths, as desired.

One side guide rail 5 of trackway B has a curved prong extension or fender 7, concavely rounded toward approaching unit movement, and terminating approximately at the middle of the conveyer.

Its terminal is thus in position to engage and deflect inwardly certain ones of the oncoming units to cause them to enter the receiving throat of the lateral conveyer of trackway B.

For the purpose of providing clearance around the fender 7 and guiding control of other alternating units, not thus selected for entrance onto the lateral conveyer, the opposite guide rail 5 of the main trackway is bowed outwardly as at 8 with rounded junction as at 9, thus forming a confining and switching pathway, back to the main line of travel along section AA, as indicated.

A similar bridge plate 4a, beyond the flights 2, provides a supporting surface for the units in their arcuate path.

At each under side of the diverging portions of guides 5 from their normal uniform parallel spacing towards the junction, are inwardly adjustable shifting arms 10. These arms are adapted to conform edgewise with the diverging sections 6 leaving ample gradually increasing spacing width for both longitudinal and lateral unit movement. either arm may be thrust inwardly from its side to direct all units either longitudinally or laterally, as desired.

Such arms may be resiliently or flexibly connected with the guides 5 as by a supporting bracket 11, and are thrust inwardly as in Fig. 2 at one side or the other by any suitable means, as a lever 12. When thus arranged such lever may merely bear against the shifting arm, or when pivotally connected as at 13 in Fig. 6, the lever may be positively connected as by a pin 14 slidably engaging slot 15 of guide plate 16. The lever 12 may be provided with any suitable operating means, as connecting rod 17 having a terminal grip 18, or other suitable moving and holding mechanism located adjacent the receiving station of either conveyer.

By such arrangement, with the fending or shifting arms 10 both in retracted position as in Fig. 1, advancing units 2 of the main conveyer A will be deflected alternately by prong 7 to the throat of conveyer B, the next unit passing outwardly and inwardly around through the widened clearance zone and onto section AA, the next unit passing to the lateral conveyer, and so on, as urged by the oncoming conveyer propelled rear column of units.

When, due to temporary stoppage of the lateral conveyer load for any reason, the operator at its terminal station thrusts the appropriate arm 10 inwardly as in Fig. 2, whereupon all units will be by-passed to the main conveyer extension AA. On the other hand, if it is desired to terminate main conveyer delivery and shift all units to the lateral conveyer B, such arm is retracted and the opposite arm 10 is thrust inwardly, as in dotted lines Fig. 2, directing all oncoming units to the lateral conveyer.

In either case movement of the units, as conveyed or as urged along by rear units will be facilitated by the flush supporting bridge plates 4 and 4a.

In the arrangement of the lateral conveyers B^1 and B^2 of Figs. 3 and 5 the construction and operation is generally similar, except that the lateral conveyers diverge from the delivering terminal of main conveyer A^1 in opposite directions, for distribution of approximately equal portions of units to each.

In such operation, as in Fig. 3 both shifting arms 10 are retracted, and the units are alternately deflected by a double curved horn extension 7a of outer guides 5, terminating in a common end point 19. By such arrangement the units 2 are moved over the opposite side bridge plates 4b and onto the flights 2 of each lateral conveyer by conveyer chain movement in advance of the oncoming main unit column, for delivery to their terminal stations.

As shown in Fig. 5 all the units may be guided over to one lateral conveyer or the other by inward adjustment and location of the appropriate shifting arm 10, as already described.

Fig. 7 is a detail view illustrating a modified construction of angular shaped shifting arm 10a pivoted at 20 and provided with a unit deflecting extension 21 adapted to be thrust inwardly across the main trackway at either side by connecting rod 17. Such arms are normally retracted until it is desired to deflect all of the units towards one or the other of the delivery conveyer trackways in the same manner already described. Extension 21 is preferably tapered as shown so as to enter between adjacent units on an annular path around pivotal center 20, representing its edge for engagement and shifting towards the opposite side of oncoming units, as will be readily understood.

Limiting stops or abutments 22, 23 are preferably utilized for controlling the desired or necessary movement inwardly and outwardly of the path of unit travel.

The construction and operation of the invention will be readily understood and appreciated by all those familiar with the art of moving or transporting bottles or the like along through main and branch trackways of the kind illustrated and described. Various changes, alterations or modifications may be made by the skilled mechanic in adapting the system to local or special conditions, or in particular features or details, within the scope of the following claims.

What I claim is:

1. In combination, a main actively propelling conveyer having communicating junction with a similar branch conveyer providing a pair of diverging distributing trackways beyond said junction, a middle concaved horn, interconnecting flanking guides for directing and maintaining units in transfer along both conveyer trackways, and a switching device adapted to be normally withdrawn beyond the inner face of one of said guides and to be moved inwardly from one inner side face of the main conveyer guide to direct units towards one of said diverging distributing trackways and to one side of said horn.

2. In combination, a main actively propelling conveyer having communicating junction with a similar branch conveyer providing a pair of diverging distributing trackways beyond said junction, a middle concaved horn, interconnecting flanking guides for directing and maintaining units in transfer along both conveyer trackways and providing a widened flaring throat at said junction, and a switching device adapted to be normally withdrawn beyond the inner face of one of said guides and to be moved inwardly of said throat from one inner side face of the main conveyer guide to direct approaching units towards one of said diverging distributing trackways and to one side of said horn.

3. In combination, a main actively propelling conveyer having communicating junction with a branch conveyer providing a pair of diverging distributing trackways beyond said junction, interconnecting flanking guides for directing and maintaining units in transfer along both conveyer trackways and providing a widened flaring throat at said junction, cooperating flanking guides for the distributing trackways having a fixed concaved horn terminating between the flaring throat portions of the main conveyer guides, and a switching device adapted to be moved from one side of the main conveyer inwardly of said throat to direct approaching units towards one of said distributing trackways and into engagement with said horn.

4. In conveyers of the driven roller or sprocket chain type for cylindrical units, a main supply conveyer and a pair of diverging delivery conveyers leading therefrom, flanking guides for the main conveyer extending along one side of each of the delivery conveyers, coacting companion guides for the delivery conveyers terminating at the junction with the main conveyer in a fixed concaved unit-engaging horn, the main conveyer guides being flared towards the main and delivery conveyer junction providing a widened clearance space, and a switching device adapted to be moved inwardly from one flared side of the main conveyer guide to direct units towards one of said delivery conveyers and into engagement with said horn.

5. In conveyers of the driven roller or sprocket chain type for cylindrical units, a main supply conveyer and a pair of diverging delivery conveyers leading therefrom, flanking guides for the main conveyer extending along one side of each of the delivery conveyers, coacting companion guides for the delivery conveyers terminating at the junction with the main conveyer in a fixed concaved unit-engaging horn, the main conveyer guides being flared towards the main and delivery conveyer junction providing a widened clearance space, a bridge plate at each side of the main conveyer between it and each delivery conveyer and flush therewith, and separate switching devices one at each side of the main conveyer adapted to be separately moved inwardly from either flared side of the main conveyer guide to direct units towards one or the other of said delivery conveyers and into engagement with said horn.

6. In combination, a main actively propelling conveyer, a similar lateral conveyer communicating therewith on the same plane, interconnecting flanking guides for directing and maintaining units in transfer along and upon the main and lateral conveyers respectively, a middle concaved horn, and a switching arm having an inner bearing face normally registering with the bearing face of a flanking guide at one side of the main conveyer adapted to be extended towards the other side thereof to direct units towards the lateral conveyer and to one side of said horn.

7. In combination with the diverging flaring guides of a main actively propelling conveyer leading to its junction with a pair of separately delivering diverging conveyers, a middle stationary reversely concaved unit-engaging horn, means for directing conveyed units from the main conveyer towards one of the delivery conveyers and against said horn consisting of a switching device adapted to be moved inwardly from underneath one of the flaring guides having an inner portion providing when so moved an inclined face for directing units towards said delivery conveyer.

8. In combination with the diverging flaring guides of a main actively propelling conveyer leading to its junction with a pair of separately delivering conveyers, intervening bridge plates, and a middle concaved horn, means for directing conveyed units from the main conveyer over one of said bridge plates towards one of the delivery conveyers and to one side of said horn consisting of a switching device adapted to be moved inwardly from underneath one of the flaring guides having an inner portion providing when so moved an inclined face for directing units towards said delivery conveyer.

9. In combination with the diverging flaring guides of a main actively propelling conveyer leading to its junction with a pair of separately delivering conveyers, and a middle concaved horn, means for directing conveyed units from the main conveyer towards one side of said horn consisting of an inwardly movable switching arm movably connected with its inner face in operative conformity with the inner face of a main conveyer guide, and means for moving the arm inwardly partly across the main conveyer path towards such delivery conveyer.

10. In combination with the diverging flaring guides of a main actively propelling conveyer leading to its junction with a pair of separately delivering conveyers, and a middle concaved horn, means for directing conveyed units from the main conveyer towards one side of said horn consisting of an inwardly movable normally retracted switching arm movably connected with its inner face in operative conformity with the inner face of a main conveyer guide, and means for moving the arm inwardly partly across the main conveyer path towards such delivery conveyer and for receding it to inoperative position.

11. In combination with the diverging flaring guides of a main actively propelling conveyer leading to its junction with a pair of separately delivering conveyers at opposite sides of a fixed deflecting horn, means for directing conveyed units from the main conveyer laterally of said horn and towards one of the delivery conveyers consisting of a pair of independent inwardly movable switching arms movably connected with their inner faces in operative conformity with the inner face of each main conveyer guide, and means for moving either arm inwardly partly across the main conveyer path towards one of such delivery conveyers.

12. In combination with the diverging flaring guides of a main actively propelling conveyer leading to its junction with a pair of separately delivering conveyers at opposite sides of a fixed deflecting horn, means for directing conveyed

units from the main conveyer laterally of said horn and towards one of the delivery conveyers consisting of a pair of independent inwardly movable switching arms movably connected with their inner faces in operative conformity with the inner face of each main conveyer guide, and a lever for each arm for moving it inwardly partly across the main conveyer path towards one of such delivery conveyers.

13. In combination with the diverging flaring guides of a main actively propelling conveyer leading to its junction with a pair of separately delivering conveyers at opposite sides of a fixed deflecting horn, means for directing conveyed units from the main conveyer laterally of said horn and towards one of the delivery conveyers consisting of a pair of independent inwardly movable switching arms movably connected with their inner faces in operative conformity with the inner face of each main conveyer guide, and a lever for each arm for moving it inwardly partly across the main conveyer path towards one of such delivery conveyers and for withdrawing the arm to inoperative position.

14. In combination with the diverging flaring guides of a main moving conveyer leading to its junction with a pair of separately delivering diverging moving conveyers, a middle stationary reversely concaved unit-engaging horn at said junction, means for directing conveyed units from the main conveyer towards one of the delivery conveyers and against said horn consisting of an angle shaped switching arm pivotally mounted beyond one of said flaring guides provided with a guiding edge adapted to be moved inwardly partly across the main conveyer whereby its edge assumes an inclined position with relation to the path of the main conveyer for deflecting approaching units towards one of said separately delivering conveyers.

15. In combination with the diverging flaring guides of a main moving conveyer leading to its junction with a pair of separately delivering diverging moving conveyers, a middle stationary reversely concaved unit-engaging horn at said junction, means for directing conveyed units from the main conveyer towards one of the delivery conveyers and against said horn consisting of an angle shaped switching arm pivotally mounted beyond one of said flaring guides provided with a guiding edge adapted to be moved inwardly partly across the main conveyer whereby its edge assumes an inclined position with relation to the path of the main conveyer for deflecting approaching units towards one of said separately delivering conveyers, said switching arm having an abutment limiting its inward movement.

16. In combination with the guides of a main moving conveyer leading to its junction with a pair of separately delivering moving conveyers having flanking guides, a middle laterally deflecting guide between said pair of conveyers at their junction, and means for directing conveyed units from the main conveyer towards one of the delivery conveyers consisting of a pivotally mounted angle shaped switching arm provided with a guiding edge adapted to be moved inwardly partly across the main conveyer whereby its edge assumes an inclined position with relation to the path of the main conveyer for deflecting approaching units towards one of the said separately delivering conveyers.

CHRISTIAN N. BERGMANN.