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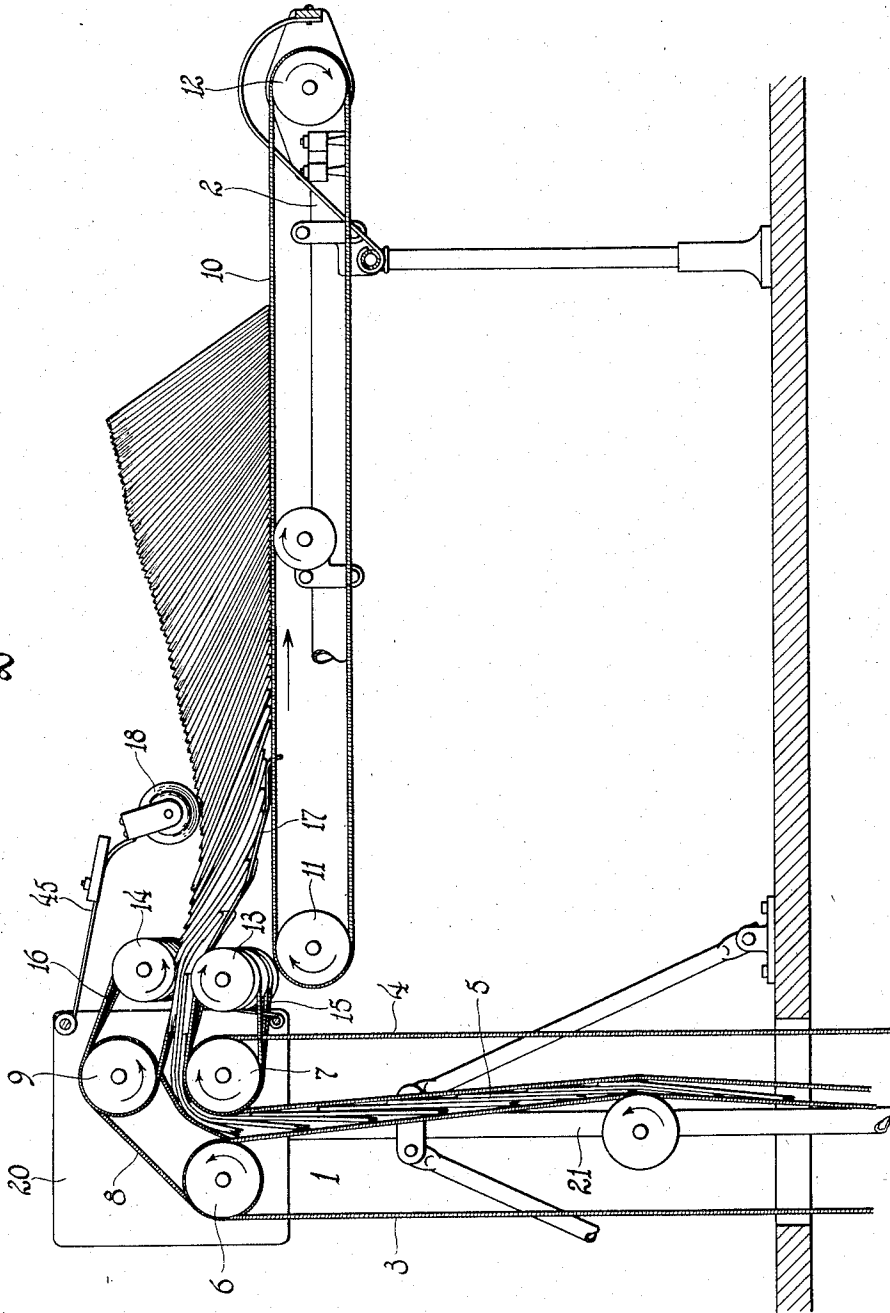
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DELIVERY APPARATUS

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2 Sheets-Sheet 1

Fig. 1



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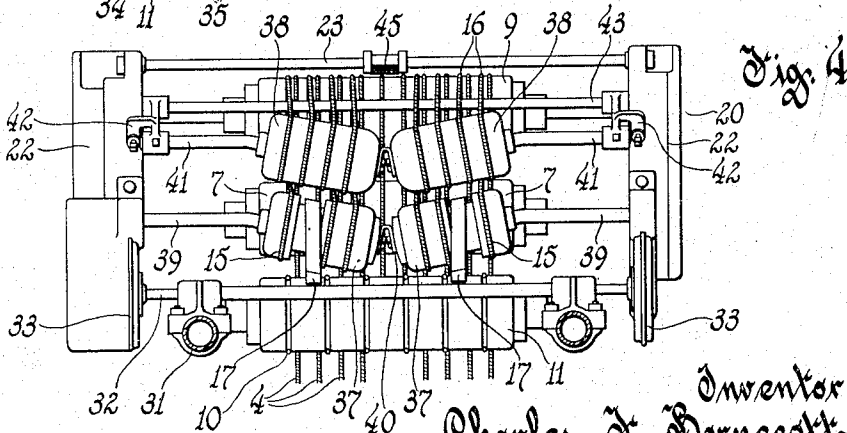
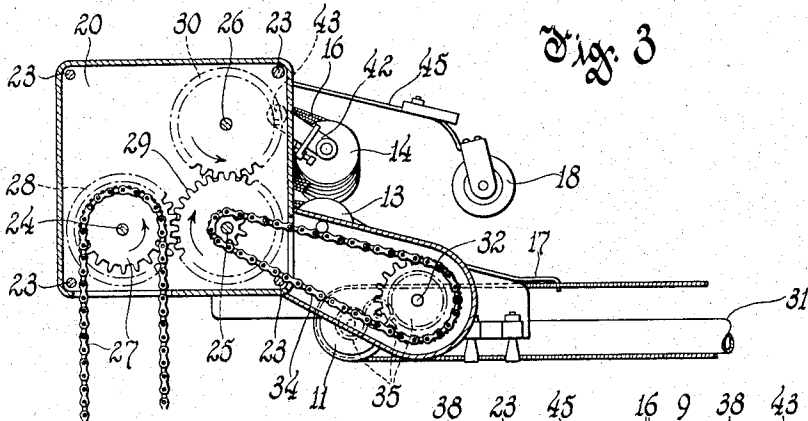
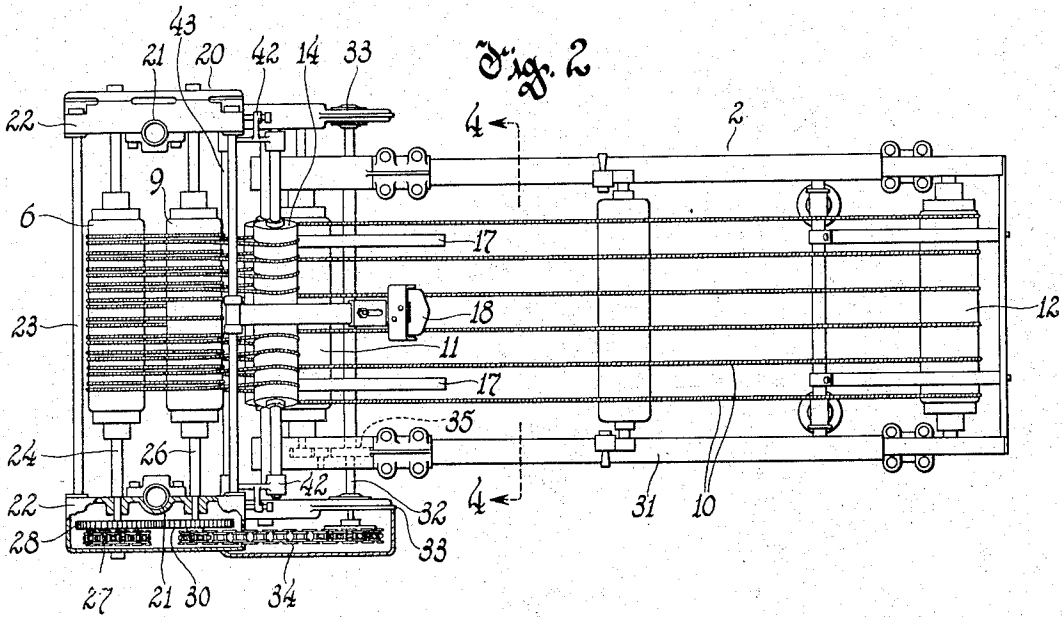
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# UNITED STATES PATENT OFFICE

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## DELIVERY APPARATUS

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to Cutler-Hammer, Inc., Milwaukee, Wis., a  
corporation of Delaware

Application June 29, 1934, Serial No. 733,043

2 Claims. (Cl. 271-68)

This invention relates to an improved method of delivering flexible articles such as tabloid papers to a delivery table and also to apparatus for carrying out such method.

5 Tabloid papers have a single fold arranged at right angles to the direction in which the same are delivered from the press, and heretofore such papers were usually carried from the press and delivered upon a delivery table by flat conveying apparatus of the type ordinarily employed in newspaper installations. However, when tabloid papers are delivered in this manner the same bend very easily in the direction of delivery and as a result considerable difficulty has heretofore been encountered in effecting proper stacking thereof upon the delivery table. This is especially true where the delivery is such that stacking is effected by pushing the incoming papers under the papers already on the delivery table.

20 The present invention has among its objects to provide a method of delivering flexible articles, such as tabloid papers, to a delivery table to facilitate stacking thereof.

25 Another object is to provide a simple and reliable mechanism for carrying out such method.

Various other objects and advantages of the invention will hereinafter appear.

30 The accompanying drawings exemplify the method and certain of the preferred elements for carrying out such method, and also illustrate a mechanical embodiment of such elements. The means for carrying out the method may of course be embodied in other forms.

In the drawings,

35 Figure 1 is a simplified side view of a conveyor and a delivery table having elements associated therewith for carrying out the method.

40 Fig. 2 is a plan view, partly in section, of a mechanical embodiment of the elements shown in Fig. 1.

Fig. 3 is a side view partly in section of certain of the parts shown in Fig. 2, and

Fig. 4 is a sectional view on line 4-4 of Fig. 2.

45 The method will be explained in connection with Fig. 1 which shows a conveyor 1 for carrying tabloid papers from a press to a delivery table 2. The conveyor shown is of a well known type and includes two sets of vertically arranged helical spring belts 3 and 4 which are adapted to carry tabloid papers 5 upwardly therebetween in an overlapped relation. The upper ends of the belts 3 and 4 pass over grooved cylindrical driving rollers 6 and 7, respectively, and upon delivery of the papers between said rollers the same are deflected forwardly over roller 7 by a set of

5 helical spring belts 8 passing over roller 6 and a grooved driving roller 9. The delivery table 2 is also of a well known type and includes a set of horizontally arranged helical spring belts 10 which are supported at opposite ends by grooved cylindrical rollers 11 and 12 and are driven at a speed which is materially less than that of the belts of conveyor 1.

10 In accordance with the present invention the papers are conveyed from conveyor 1 to delivery table 2 by mechanism which serves to distort the papers in a manner whereby the same are stiffened in the direction of delivery to thereby facilitate stacking thereof upon the delivery table 2. 15 The mechanism employed for this purpose includes two sets of rollers 13 and 14, the former set of rollers being connected to the driving roller 7 by a set of helical spring belts 15 and the latter being connected to driving roller 9 by a set of helical spring belts 16. The papers are thus carried between the sets of rollers 13 and 14, from conveyor 1, by the sets of belts 15 and 16 and as will be hereinafter more fully set forth said sets of rollers act to trough the papers along a line extending in the direction in which the same are delivered. Upon leaving the sets of rollers 13 and 14 the papers slide over a pair of stationary guides 17 and are maintained troughed until the same are delivered upon the belts 10 of the delivery table by a floating guide roller 18. 30

35 Obviously troughing of the papers in the manner hereinbefore described serves to materially stiffen the same in the direction of delivery to thereby facilitate stacking thereof upon the delivery table 2. In the embodiment illustrated in Fig. 1 the papers are overlapped in such a manner that stacking thereof upon the delivery table is effected by pushing the incoming papers under the papers already on the delivery table and the 40 aforescribed method of delivery is particularly desirable in such installations. However, such method of delivery is also desirable where the papers are overlapped in such a manner that the incoming papers slide over the stack of papers already on the delivery table. The aforescribed method of delivery is also desirable in that troughing of the papers tends to prevent unfolding thereof during delivery upon the table.

50 Referring now to Figs. 2 to 4, inclusive, the same illustrate a mechanical embodiment of the elements shown in Fig. 1. The driving rollers 6, 7, and 9 of conveyor 1 are mounted upon a supporting frame 20 which may be supported at opposite ends by a pair of pipe stanchions 21-21, 55 one of which is shown in Fig. 1. Said supporting

frame is provided with a pair of square end members 22—22 which are secured together at their corners by a plurality of tie rods 23 and the rollers 6, 7, and 9 are secured to shafts 24, 25, 26, respectively, which are rotatably mounted in bearings provided in said end members. Roller 6 is usually driven from the press through the medium of a chain and sprocket drive 27 (Fig. 3) and the shafts 25 and 26 of rollers 7 and 9 are driven from the shaft 24 of roller 6 through the medium of spur gears 28, 29, and 30 which are arranged as shown in Fig. 3.

The delivery table is provided with a supporting frame 31 and the roller 11 of said delivery table is rotatably mounted upon the left hand end of said supporting frame while the roller 12 thereof is mounted upon the right hand end thereof. Said supporting frame is pivotally mounted adjacent its left hand end upon a shaft 32 carried between a pair of brackets 33—33 which are secured to the end members 22—22 of frame 20. Shaft 32 is driven from the shaft 25 of roller 7 through the medium of a chain and sprocket drive 34 and roller 11 is driven from shaft 32 through the medium of a train of spur gears 35 shown in dotted lines in Figs. 2 and 3. The chain and sprocket drive 34 and the spur gears 35 serve to drive the roller 11 in the direction of the arrow in Fig. 1, at a speed which is materially less than that of conveyor 1, to thereby provide for stacking of the papers as the same are delivered upon belts 10.

The set of rollers 13 includes a pair of cylindrical rollers 37—37 while the set of rollers 14 includes a pair of cylindrical rollers 38—38. The rollers 37—37 are rotatably mounted upon shafts 39—39 fixed to the end members 22 of supporting frame 20, and as shown in Fig. 4 the adjacent ends of said shafts are connected by a link 40 and are bent downwardly whereby the axes of said rollers form a shallow V. The rollers 38—38 are arranged immediately above the rollers 37—37 and are rotatably mounted upon shafts 41—41, each of which is secured to a link 42 rotatably mounted upon a rod 43 carried between the end members 22. As shown in Fig. 4, the inner ends of the shafts 41 are also bent downwardly so that the axes of rollers 38 form a shallow V. With the sets of rollers 13 and 14 arranged as above described it is apparent that the same provide

for troughed delivery of the papers for the purpose hereinbefore set forth.

As hereinbefore stated, the papers in leaving the sets of rollers 13 and 14 slide over a pair of stationary guides 17 and are maintained troughed until the same are delivered upon the belts 10 of the delivery table by a floating guide roller 18. The guides 17 are arranged in spaced relation adjacent opposite sides of the delivery table and the left hand ends thereof pass over the rollers 37—37 and are secured to the lower right hand tie rod 23 of frame 20. As shown in Fig. 4, the stationary guides 17 are located in recesses provided in the rollers 37—37. The guide roller 18 is rotatably mounted upon the free end of an arm 45 which is pivotally mounted upon the upper right hand tie rod 23 of frame 20. As shown in Fig. 2, the guide roller 18 is located between the stationary guides 17 whereby the same acts to hold the papers in troughed position as the same slide over said stationary guides.

What I claim as new and desire to secure by Letters Patent is:

1. In a conveyor of the character described, two sets of helical spring wire belts having adjacent sides for receiving flexible sheet articles therebetween, said belts being driven with their adjacent sides in the same direction and at the same speed to advance the articles placed therebetween, and a pair of grooved cylindrical rollers for supporting the delivery end of each of said sets of belts, each of said pairs of rollers being arranged with their axes forming a V to trough the articles along a line extending in the direction of travel thereof as the same are delivered by said belts.

2. A conveyor of the character described, comprising a pair of rotatable cylindrical rollers arranged end to end with their axes forming a shallow V, a second pair of rotatable cylindrical rollers mounted above said former rollers and arranged to ride thereon and mechanism for delivering flexible sheet articles between said sets of rollers including two sets of helical spring wire belts each passing over one of said sets of rollers, said sets of belts having adjacent sides for receiving the flexible sheet articles therebetween and being driven at the same speed and in a direction to effect delivery of the articles between said pairs of rollers.

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