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UNLOADING DEVICE FOR BELT CONVEYERS

Filed Dec. 14, 1925

2 Sheets-Sheet 1

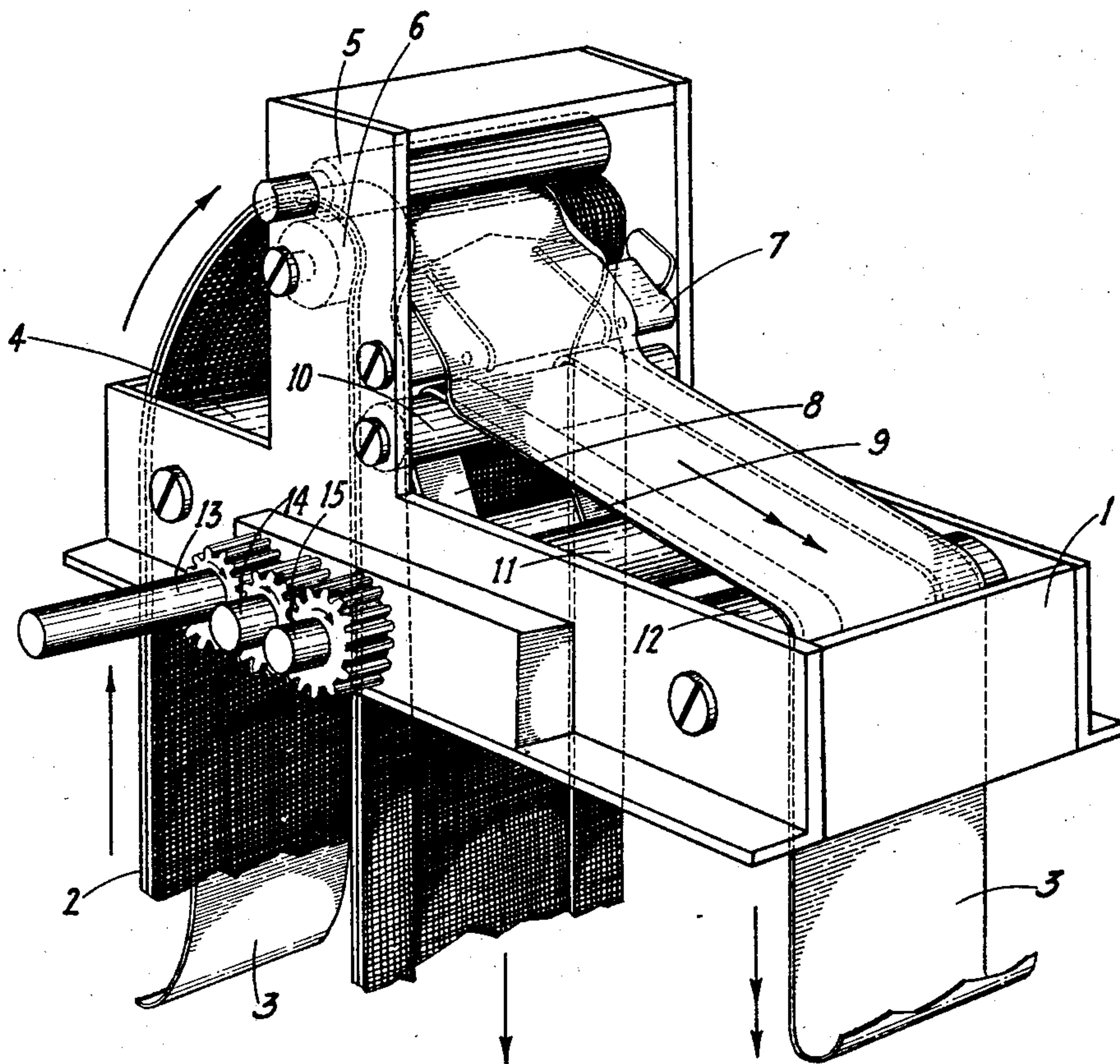


Fig. 1

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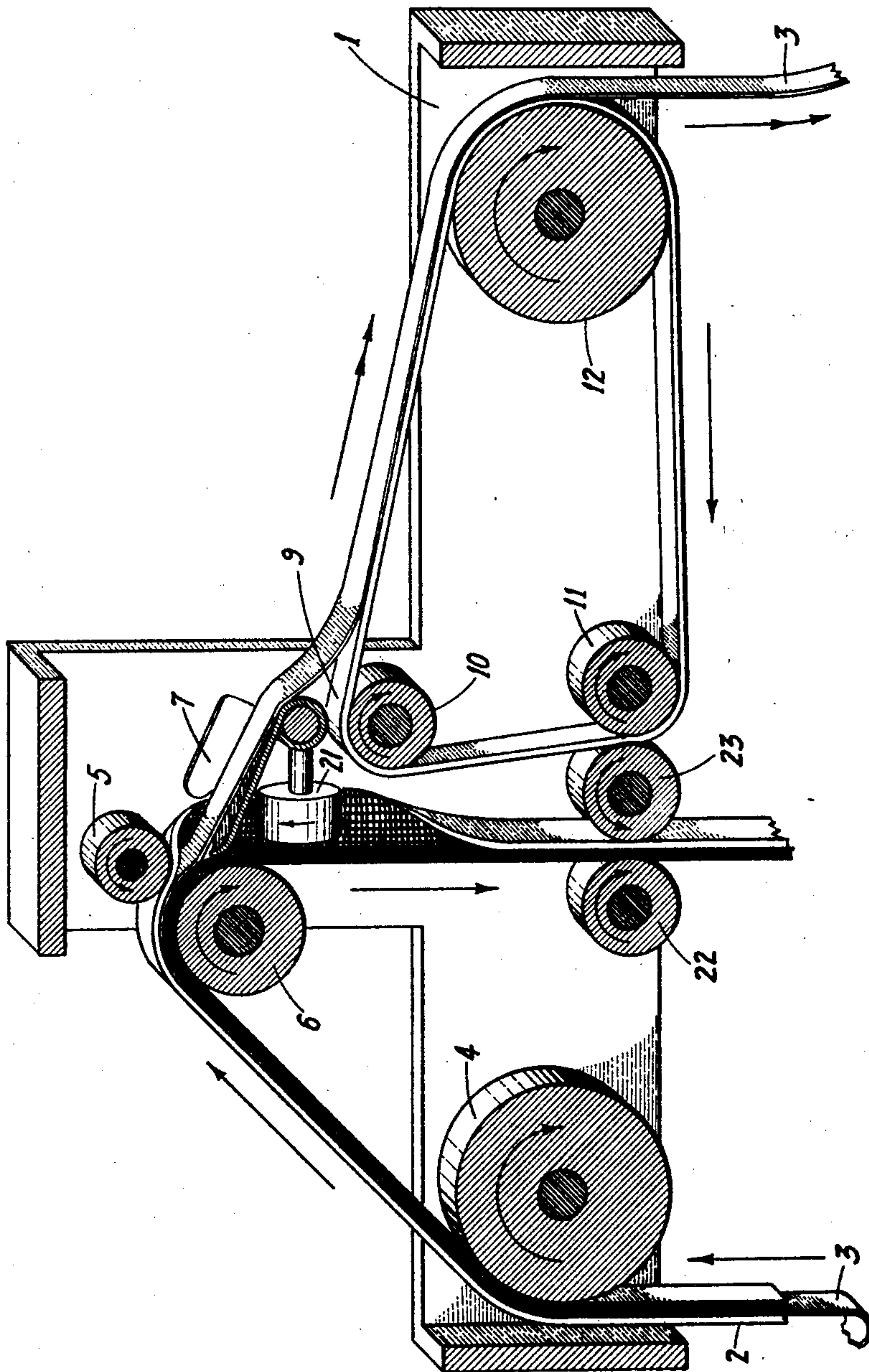


Fig. 2

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UNLOADING DEVICE FOR BELT CONVEYERS.

Application filed December 14, 1925. Serial No. 75,414.

This invention relates to unloading devices for belt conveyers, and more particularly to arrangements in such devices for unloading or separating paper or other flexible material from a flapped belt, the flaps of the belt being employed for gripping the paper or other flexible material to the belt.

A long strip of paper, when conveyed through chemical solutions, becomes wet, and consequently tends to increase in length. Because of the low tensile strength of the paper, it will tear when pulled through such solutions. It is in view of these difficulties that it has been found desirable to provide a flapped belt in a conveying system for conveying the paper through such chemical solutions, the flaps of the belt being employed for gripping the paper to the belt. After the paper has been gripped by the flaps of the belt, and after it has passed through the chemical solutions, it is also necessary to provide means for unloading or separating the paper from the belt.

It is therefore one of the objects of the invention to provide a suitable device for unloading a long strip of paper from a flapped belt, which device has means associated therewith for spreading the flaps of the belt so that the paper may be separated therefrom. It is also an object of the invention to provide arrangements for releasing the flaps of the belt after the paper has been separated from the belt.

While the nature of the invention will be pointed out with particularity in the appended claims, the invention itself, both as to its objects and features, will be better understood from the detailed description hereinafter following when read in connection with the accompanying drawing, in which Figure 1 represents a perspective of one possible unloading device suitable for a flapped belt conveyer, and Fig. 2 represents a longitudinal cross-section of the particular device shown in perspective in Fig. 1. Similar parts will be designated by similar reference characters wherever they appear throughout the drawing.

One possible type of unloading device is shown in perspective in Fig. 1. The reference character 1 designates the base of the unloading device. A flapped belt 2 which has paper 3 thereon, gripped by the flaps of the belt 2, moves toward the unloading device in the direction indicated by the ar-

row at the left-hand side of the drawing. It passes over a rotatable roller 4 which has its axis of rotation parallel with the surface of the movable belt 2. It then moves between two rotatable rollers 5 and 6 each having its axis of rotation parallel with the surface of the belt. After passing the rotatable rollers 5 and 6, the flaps of the belt 2 are spread apart a sufficient distance so that the paper 3 on the movable belt may be separated therefrom. In the particular device shown and described, the flaps are spread apart by means of a pair of rotatable rollers (not shown), each having its axis of rotation perpendicular to the surface of the belt. These latter rotatable rollers are so placed with respect to the belt that the flaps thereof move against them and are spread apart as the belt passes these rollers. A stationary sheet of metal 7, having a knife edge, is so placed with respect to the movable belt 2, that as the flaps of the belt are spread apart, the paper thereon is divergently deflected with respect to the belt and passes over the surface of the sheet of metal 7. The sheet of metal 7 may have end projections for guiding the paper after it has been separated from the movable belt. The surface of the sheet of metal 7 may have a shape such that as the paper separated from the movable belt 2 passes thereover, there is very little friction. The paper 3 then moves over two other movable belts 8 and 9 in the direction indicated by the double pointed straight line arrows.

The two movable belts 8 and 9 move over three rotatable rollers 10, 11 and 12, all of which revolve in the same direction. It will be understood that these two belts may be replaced by a single belt and that the surface of these rotatable rollers 10, 11 and 12 may have grooves thereon for guiding the belts 8 and 9, respectively, so as to avoid the slippage of these belts. The rotatable shaft 13, having a gear keyed to it, may be connected by means of still another belt to a motor for driving the rotatable shaft 13. Two other rotatable shafts 14 and 15, respectively, each also having a gear keyed thereto are in alinement with the gear keyed to the rotatable shaft 13 and these gears mesh so that they revolve in the directions indicated by the arrows on these gears. Consequently the rotatable rollers on the same shafts as these gears 13, 14 and 15 revolve

in the same directions as these respective gears.

Fig. 2 shows a longitudinal section of the particular unloading device shown in Fig. 1. The movable belt 2 with the paper 3 thereon gripped to the belt by the flaps, moves toward the unloading device in the direction of the arrow shown at the left-hand side of the drawing. It then moves over the rotatable roller 4 of this device and then between the rotatable rollers 5 and 6 which revolve in opposite directions. It then comes to the arrangements of the device for spreading the flaps of the belt so as to allow the paper to be separated therefrom. In this figure, there is shown a single rotatable roller 21 having its axis of rotation perpendicular to the surface of the belt, and this roller is so placed with respect to the belt, that one of the flaps moves against the surface of this rotatable roller, so that this flap is spread apart as the belt passes this point. But there are two such rollers in this device and as both of the flaps of the movable belt 7 are spread apart, the sheet of metal 7 having a knife edge is held against the surface of the belt so that the paper may be divergently deflected with respect to the belt. This sheet of metal 7 is fixed in position on the base 1 of the device. The paper 3 moves over the surface of the sheet of metal 7, then over a belt 9 and the rotatable roller 12 to some form of receiving means (not shown). This receiving means may include a drier well-known in the art for drying the paper if the paper has previously been passed through chemical solutions. The rotatable rollers 22, 23 and 11, are on the same shafts as the gears on the rotatable shafts 13, 14 and 15, respectively, shown in Fig. 1, and these rollers revolve in the directions indicated by the arrows on these rollers. The belt 2 moves between the rotatable rollers 22 and 23 and as the belt passes these rollers, the flaps are restored to their initial positions. The restoring means, however, may not be deemed necessary if the flaps of the belt are made of an elastic medium.

It will be understood that it is within the scope of this invention to provide any combination of elements such that as a movable flapped belt passes a particular point, there are at that point one or more rotatable rollers each having its axis of rotation perpendicular to the belt for spreading the flaps of the belt, and a sheet of metal so placed with respect to the movable belt, that the paper thereon is deflected in a direction different from the direction of motion of the belt.

It will be understood that while one type of unloading device for a belt conveyer has been shown and described herein in connection with this invention, the invention is not limited to the particular type of device

shown and described, but the invention may be embodied in other and widely varied organizations without departing from the spirit of the invention and the scope of the appended claims.

What is claimed is:

1. In combination, a movable flapped belt having paper thereon gripped by the flaps of the belt, and means for spreading the flaps of the belt so as to allow the paper on the movable belt to be separated therefrom.

2. In combination, a movable flapped belt having paper thereon gripped by the flaps of the belt, means for spreading the flaps of the belt so as to allow the paper thereon to be separated therefrom, means for separating the paper from the belt, and means for returning the flaps of the belt to their overlapped condition after the paper has been separated therefrom.

3. In combination, a movable flapped belt having a strip of flexible material such as paper gripped to the movable belt by the flaps thereof, and a pair of rotatable rollers each having its axis of rotation perpendicular to the surface of the movable belt, said rotatable rollers being so placed with respect to the movable belt that the flaps thereof are spread apart to allow the flexible material such as paper to be separated from the movable belt.

4. In combination, a movable flapped belt having a strip of flexible material such as paper gripped to the belt by the flaps thereof, a pair of rotatable rollers each having its axis of rotation perpendicular to the surface of the belt, said rotatable rollers being so placed with respect to the movable belt that the flaps thereof are spread apart to allow the flexible material such as paper to be separated from the movable belt, and means for returning the flaps of the movable belt to their overlapped condition after the strip of paper has been separated from the movable belt.

5. In combination, a movable flapped belt, a strip of paper gripped by the flaps of said movable belt, a pair of rotatable rollers each having its axis of rotation perpendicular to the surface of the movable belt, said rotatable rollers being so placed with respect to the flaps of the movable belt that said flaps are spread apart sufficiently to allow said strip of paper to be separated from said movable belt, means for separating the strip of paper from the movable belt, and means for returning the flaps of the movable belt to their overlapped condition after the strip of paper has been separated therefrom.

6. In combination, a movable flapped belt, a long strip of paper gripped to the belt by the flaps thereof, a pair of rotatable rollers each having its axis of rotation perpendicular to the surface of the belt, said rotatable rollers being so placed with respect to the

movable belt that the flaps thereof move against said rollers and are spread apart thereby, means for separating the strip of paper from the movable belt after the flaps have been spread apart, and means for returning the flaps of the movable belt to their overlapped condition after the strip of paper has been separated therefrom.

7. In combination, a movable flapped belt, a long strip of paper gripped to the movable belt by the flaps thereof, a pair of rotatable rollers each having its axis of rotation perpendicular to the surface of the movable belt, said rotatable rollers being so placed with respect to the movable belt that the flaps thereof are spread apart by said rollers, a stationary sheet of metal having a knife edge touching the movable belt and separating the strip of paper from the movable belt after the flaps have been spread apart, and means for returning the flaps of the movable belt to their overlapped condition after the strip of paper has been separated there-

from, said stationary sheet of metal having end projections for guiding the strip of paper separated from the movable belt.

8. The method of separating a flexible strip of material from a corresponding belt conveyer with edge flaps overlying said strip, which consists in progressively and transiently deflecting said flaps as the conveyer passes a certain place, and moving the strip divergently from the conveyer at that place.

9. A device for separating a flexible strip of material from a corresponding belt conveyer with edge flaps overlying said strip, comprising means for progressively and transiently deflecting said flaps as the conveyer passes a definite point, and means for moving the strip divergently from the conveyer at that definite point.

In testimony whereof, I have signed my name to this specification this 12th day of December, 1925.

HAROLD F. PASCHEN.