Dec. 26, 1933. W. J. WRIGHT 1,941,123

DRAG CONVEYER DISCHARGE DEFLECTOR

Filed Aug. 20, 1931

FIG. 1

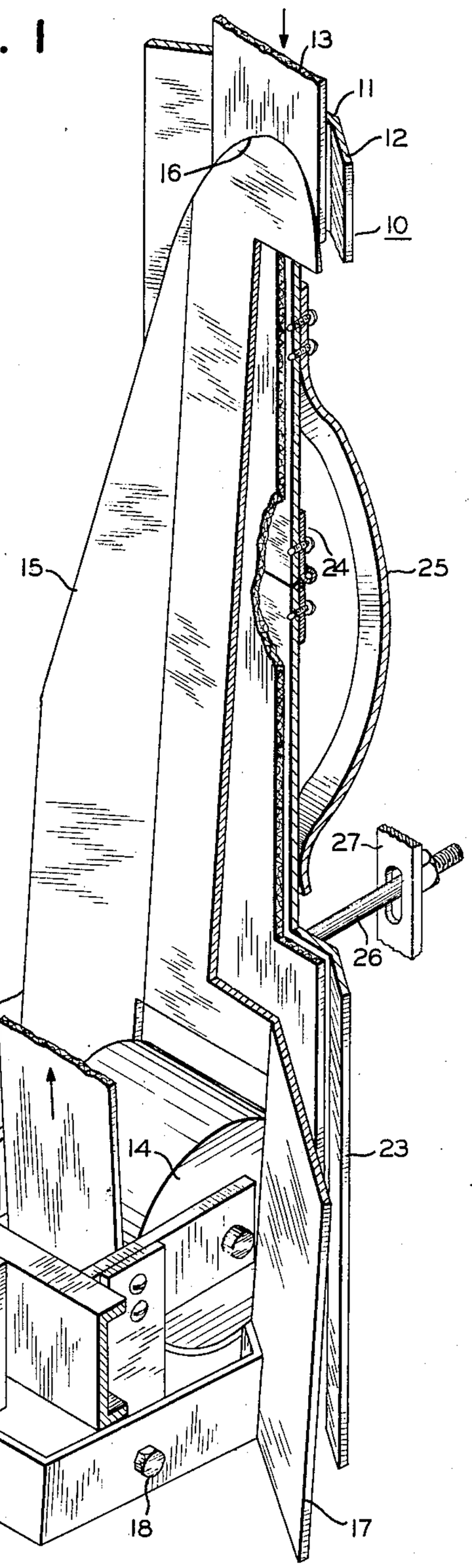
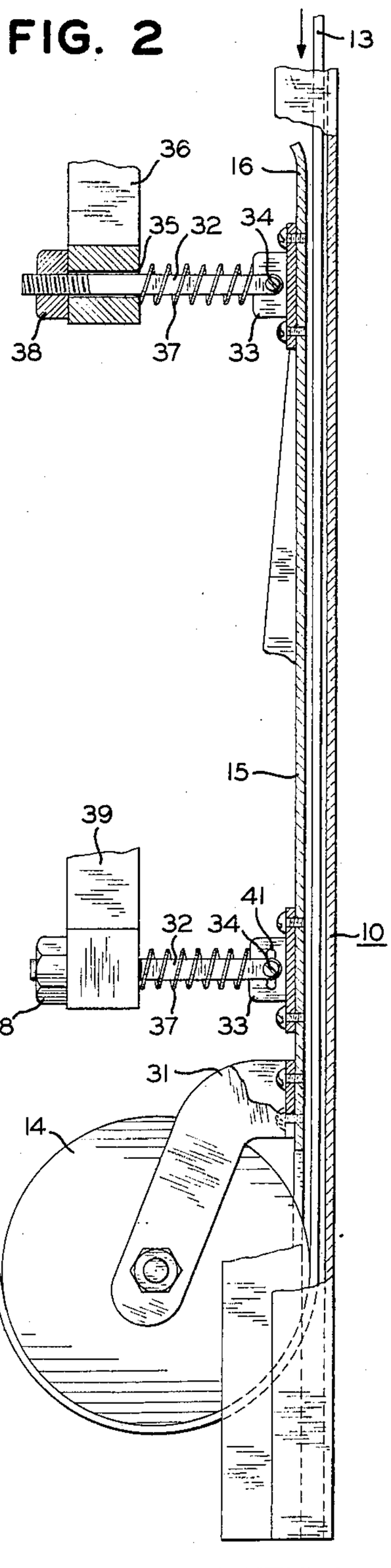


FIG. 2



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DRAG CONVEYER DISCHARGE DEFLECTOR

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5 Claims. (Cl. 198—160)

This invention relates to conveyers for sheet material, such as letters, telegrams and the like, in which articles are transported in a substantially flat or unfolded condition, and it has for an object to provide such conveyers with a discharge arrangement which will permit sheet material of different thicknesses or bulk to be effectively discharged therefrom.

This invention is particularly applicable to conveyers of a drag type such as described in the patent to F. E. d'Humy et al, No. 1,793,953, granted February 24, 1931, and entitled "Drag conveyer". Briefly the drag conveyer described in the above mentioned patent consists of a single endless belt of a width considerably less than the width of the sheet material or articles to be conveyed, the belt traveling along its main or operating run in a flat trough having outwardly flaring or diverging side walls. The articles are conveyed between the belt and the trough with the edges of the articles extending over at least a part of the flaring side walls.

The drag type of conveyers are only one form of conveyer employed in central telegraph offices for transporting telegrams from one part of the office to another or from one operator or attendant to another. The different types of conveyers are arranged to discharge at various points, and also to discharge or feed into one another.

Along the intermediate portions of the drag conveyer runs the outward edges of the sheet material are transported in a deformed shape, that is, with their outwardly extending sides or edge portions bent upwardly from the intermediate portion which is engaged between the belt and the bottom of the conveyer channel. The outwardly extending edges are transported free of the conveyer channel and it is possible that, in certain instances, the edge portions may become folded toward each other over the back of the conveyer belt. At the discharge end of the conveyer it is customary to provide a belt deflecting roller for deflecting the belt away from the channel member in order to guide it back over the return run of the conveyer. This roller is positioned adjacent the face of the trough or channel instead of adjacent the rear of the trough as in other positions in the conveyer system.

To assist in the discharge of the sheet material, and to prevent the free edges of the sheets or articles which might have been folded over the back of the belt during transportation from becoming engaged between the belt and the deflecting roller, or from following around the roller with the belt, should they adhere thereto, as by static charge accumulating on the sheets or by other causes, I provide a guide member in the general form of an inverted V having its apex adjacent the back of the belt, that is, the face thereof away from the trough, in advance of the roller, and having leg portions disposed at opposite sides of the roller. In order to accommodate different thicknesses of sheet material such as an envelope containing several messages or a group of messages which may adhere together, I propose, according to this invention, to provide yieldable elements in connection with the conveyer discharge which will permit the belt to rise or move away from the channel member. In normal position the guide member has its corresponding parts substantially parallel to the channel whereby a guideway is formed from some point in advance of the roller to the outlet end of the conveyer. The channel, or portion thereof, and the guide member extend vertically downward beyond the end of the belt to direct the articles in their proper downward course and may terminate within the opening of a tray or other receptacle, or another conveyer having means to receive the discharged material.

In one form of this invention, the deflector may be mounted yieldably away from the conveyer channel in order to accommodate the outward movement of the belt when material of appreciable thickness or bulk is being discharged. In another form, the lower section of the conveyer channel may be yieldable in order that the channel may move outward while the belt remains substantially in its normal position between the deflector and the channel member, or the arrangement may include a combination of the foregoing.

Another object of my invention is, therefore, to provide a conveyer discharge embodying members forming guide means for the material as it is discharged from the conveyer, such members being disposed to yield away from each other in order to provide for discharging material of various bulk and thicknesses.

Still another object of this invention is to provide an arrangement which will enable material of various bulk and thickness to be carried past the belt deflecting roller without stoppage or binding of the material occurring in the discharge structure.

These and other objects are effected by my invention, as will be apparent from the following

description and claims taken in connection with the accompanying drawing, forming a part of this application, in which:

Fig. 1 is a view partly in section showing the deflector plate and lower portion of the channel member pivotally mounted; and,

Fig. 2 is a view partly in section showing the channel member rigid and the deflector mounted to yield throughout its length with respect to the channel member.

The drag conveyer as shown in the drawing comprises a channel member 10 having a base portion 11 and outwardly flaring sides 12, and a belt 13 of a width substantially the same as the width of the base portion 11, the belt traveling in the channel in frictional contact with the base so as to convey sheet materials such as telegram blanks or other articles between the conveyer belt 13 and the trough. The sides of the telegram blanks or other articles extend out over the flaring side walls 12 as they are being conveyed along the channel and assume a substantially concave shape. The trough or channel member 10 serves as a guide for the belt, and on horizontal runs as a support therefor, and the flaring sides 12 prevent the articles from working out from under the belt at either side thereof.

The drawing shows only the outlet or discharge section of the conveyer and is arranged with the trough and belt directed vertically downward, the belt passing around an end roller 14 which deflects or guides the belt away from the channel member in advance of the discharge end of the channel and into any convenient return path to the opposite end of the conveyer.

Referring now to Fig. 1, a guide member 15 having an upper end of a substantially inverted V-shape is disposed with its apex 16 in the conveyer channel in advance of the return roller 14 so that its apex is slightly spaced away from the back surface of the belt 13. The deflector or guide member is provided with downwardly diverging leg portions 17 extending past the opposite sides of the guide roller 14 and downward below the same, substantially parallel to and spaced from the ends of the trough or channel member 10. The guide member precludes any possibility of the ends or sides of the telegram blank which may have become bent over against the rear side of the belt from remaining in this position and thus becoming engaged between the belt and the return guide roller 14. In other words, the deflector straightens out the overhanging portions of the message blanks as they approach the discharge end of the conveyer so that they will not be caught between the belt and the return roller and also in order that the message blanks may be more effectively directed into the receiver.

As heretofore arranged the deflector 15 has been mounted more or less rigidly in place and has been arranged slightly spaced away from the back of the traveling belt 13 so as to permit the belt to run freely between the deflector and the guide channel and also to enable the belt to move slightly away from the channel as it carries message blanks or other sheet material toward the discharge end of the conveyer. This arrangement has proven satisfactory for carrying bare sheets or message blanks so fed into the conveyer that they present substantially no bulk which would move the belt appreciably away from the conveyer channel. However, when it is desired to convey a number of sheets of material together, as when a number of messages are enclosed in an envelope and deposited into the conveyor system, it has been found that the bulk of the articles of this nature in the conveyer at one point can pass the deflector plate and discharge of the conveyer only with the greatest difficulty. Where the number of blanks or the nature of the article presents considerable bulk they will not pass the discharge at all. This difficulty is obviated by yieldably mounting the deflector 15 so that, as the belt rises or moves away from the channel member in order to accommodate a number of sheets or other articles of increased bulk, the deflector plate may also move away from the channel when it is engaged by the belt. As shown in Fig. 1, the deflector plate is mounted so as to pivot adjacent its lower end about the pin 18. Also the lower end of the deflector is shown as spaced away from the conveyer channel. The upper end may be positioned so as to be slightly spaced away from the belt as in the arrangement heretofore employed. However, the pivotal arrangement at the lower end permits the upper end to move outwardly when engaged by the belt which has moved away from the channel in order to accommodate articles of considerable bulk. The deflector plate is held in position by reason of the fact that the center of gravity of the deflector plate and mounting is beyond the pivotal pin 18 and tends to turn the deflector plate clockwise toward the belt and conveyer channel. This is true when the arrangement is mounted with the conveyer channel vertically as shown in Fig. 1. It is obvious that the deflector plate may be held in place by a spring or other suitable arrangement tending to hold it toward the belt. The upper end of the deflector plate is prevented from engaging the belt while traveling in its normal position by means of stop members 19 and 21. The stop members are held apart by an adjustable screw 22 or other suitable arrangement for securing the desirable clearance between the upper end of the deflector plate and the moving belt.

In cases where the bulk of the material likely to be handled by the conveyer is only of a relatively small increased thickness, such as would stop or choke the conveyer where the belt enters the space between the upper end of the deflector plate and the channel, little difficulty would be experienced at the point where the belt passes around the return roller 14. However, where it is intended that the conveyer shall be capable of handling material of considerably increased bulk, difficulty will be experienced at the point where the belt engages the return roller. This difficulty may be overcome according to this invention, by mounting a section of the conveyer channel adjacent the discharge roller so that it may yield away from the roller as the material being discharged approaches the end of the run of the belt. As shown in Fig. 1, the lower section 23 of the conveyer channel is arranged to pivot about the joint provided by a hinge or other suitable member 24. A spring 25 or other suitable member is provided for holding the yieldably mounted section of the conveyer in its normal position. The stop or limiting member 26, which engages a stationary member 27, prevents the spring 25 from pressing the lower end of the conveyer channel against the moving belt. The stop or limiting member 26 may be provided with suitable adjusting means for obtaining the desired clearance to permit the belt to be located in its normal relation with respect to the conveyer channel.

It will be noted that the arrangement as just

described provides a discharge for a drag conveyer which will enable substantially any type of material which the conveyer is capable of handling to be effectively discharged from the conveyer terminal. Furthermore, the structural arrangement may be modified to permit the simplest form to be used which will take care of the contemplated requirements.

Referring now to Fig. 2, another embodiment of my invention is illustrated. In this embodiment both the upper and lower ends of the deflector plate are yieldably mounted while the conveyer channel is of the normal type and may be mounted rigid throughout its length. In addition, means are provided for permitting the return belt guide roller to be yieldably mounted so that it will likewise move away from the conveyer channel to accommodate the discharge of material of increased bulk.

This embodiment comprises a conveyer channel member 10 and a yieldably mounted deflector 15 between which the moving belt 13 travels. The return guide roller 14 is shown as mounted on a bracket member 31 rigidly secured to the deflector plate. The upper end of the deflector plate is provided with a bar or rod member 32 secured to the deflector plate by means of a bracket member 33 attached to the bar with a hinge joint 34. The bar is arranged to reciprocate in an opening 35 provided in a cross member 36 which may be a part of the conveyer supporting structure. A suitable compression spring 37 is disposed about the rod between the bar 36 and the mounting bracket 33 to yieldably urge the deflector plate toward the conveyer channel. At the outer end of the bar is provided an adjustable nut 38 by means of which the deflector may be suitably spaced away from the conveyer channel to provide proper clearance for the belt. This clearance is ordinarily obtained when the deflector plate is spaced slightly away from the moving belt so that the belt may travel freely between the deflector and the channel when no material is present underneath the belt.

The lower end of the deflector plate is provided with a similar arrangement for yieldably holding the plate in proper position. A similar rod 32 is secured to the bracket member 33 by means of a pivotal pin 34. This rod reciprocates in a similar manner in a member 39. A compression spring 37 urges the lower end of the deflector toward the channel while an adjustable nut 38 provides for securing the proper spacing and clearance. In order to accommodate inequalities arising by reason of one end of the deflector plate moving away from the channel ahead of the other, the pivotal pin 34 engages the bracket 33 through a slide opening 41.

With this type of deflector plate mounting, material of increased bulk which is being discharged from the conveyer will enter the upper part of the space between the channel and deflector and cause the belt to move outward and engage the upper end of the deflector plate. This causes the deflector plate to move outward against the compression spring 37, which may be of relatively small strength, and pass down toward the discharge end of the conveyer. As the material moves downward toward the mid-portion of the deflector plate the force will be exerted against the lower mounting of the deflector and cause the deflector to move outward against the tension of the lower spring. This permits the material to pass freely to the end of the conveyer discharge where it leaves the conveyer. In the meantime, as the material moves downward toward the lower end of the deflector plate the upper end is carried back to its normal position by the upper spring. With this arrangement, the upper end of the deflector plate would be in position to perform its normal function of straightening out the sides of the sheets of material approaching the same, even though material of increased bulk were yet present along the lower portions of the deflector. As soon as the material has been discharged from the conveyer, the lower end of the deflector will be moved back to its normal position by means of the lower compression spring.

By having the return roller mounted on a bracket rigid with the deflector plate, the roller likewise moves outward with the deflector plate so that material may as readily pass the roller as any other part of the discharge. However, the return roller may be mounted in any other suitable manner to permit the same to yield away from the conveyer channel when material of increased bulk passes between the roller and the conveyer channel. Likewise the deflector plate itself may be mounted in any other suitable manner from that shown and described which will permit it to yield away from the conveyer channel throughout its length.

The modified form of my invention provides a discharge arrangement in which it is necessary to yieldably mount the deflector plate only. Also an arrangement is provided for accommodating the discharge not only of material of increased bulk but for effectively handling ordinary single thicknesses of sheet material.

It is to be understood that while my invention has been described in connection with drag conveyers in which the conveyer member is described as a channel embodying side portions, that the invention is equally applicable to other types of drag conveyers.

While I have shown my invention in but two forms, it will be obvious to those skilled in the art that it is not so limited, but is susceptible to various other changes and modifications without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereon as are imposed by the prior art or as are specifically set forth in the appended claims.

What I claim is:

1. A drag conveyer for sheet material embodying a conveyer member, a belt positioned to travel along the conveyer member in contact therewith for conveying sheet material between it and the belt by frictional engagement with the belt, a discharge comprising means for deflecting the belt away from said conveyer member, and a message straightening member spaced from said conveyer member and disposed in a substantially parallel relation thereto for forming a discharge passageway, said straightening member being suitably supported to pivot adjacent the outer end of said passageway and the portion of said conveyer member disposed along said passageway being suitably supported to pivot adjacent the inner end of said passageway, whereby said passageway may expand throughout its length with the passage of material of a substantial bulk therethrough.

2. A drag conveyer for sheet material comprising a conveyer member, a belt positioned to travel on said conveyer member in contact therewith for conveying sheet material between it and the belt by frictional engagement with the belt, a roller adjacent the discharge end of said conveyer around which said belt passes, a guide member

arranged adjacent the outer side of said belt and having a forward portion of decreasing width positioned in advance of the roller and having portions extending beyond said roller, said guide member being yieldably supported to pivot about a point adjacent to the guide roller for permitting the forward portion to move away from the conveyer member when engaged by the belt.

3. A drag conveyer for conveying sheet material of varying bulk comprising a conveyer member, a belt positioned to travel on said conveyer member in contact therewith for conveying sheet material between it and the belt by frictional engagement with the belt, a roller adjacent the discharge end of said conveyer around which said belt passes to return along said conveyer, a deflector arranged adjacent the outer side of said belt and having a forward portion of decreasing width positioned in advance of the roller and having portions extending beyond said roller, the forward portion of said deflector being disposed closely adjacent to the back of the belt, said deflector being pivotally mounted near the rearward end for permitting the forward end to yield when engaged by the belt as it moves outwardly from the conveyer member for accommodating material of increased bulk, said deflector being spaced away from the conveyer member adjacent the pivoted end to provide clearance space for the belt when it is moved away from the conveyer member.

4. In a conveyer for conveying sheet material, a longitudinally extending conveyer member embodying a discharge end, a traveling belt disposed to convey material along said conveyer member, a guide roller disposed adjacent to the discharge end and around which said conveyer belt passes in its return travel, said guide roller being mounted yieldably with respect to the conveyer member, and a deflector member arranged adjacent the outer side of said belt, said deflector member having a forward portion positioned in advance of the discharge and having a rearward portion extending to the discharge end, said deflector member also being mounted yieldably with respect to the conveyer member.

5. In a conveyer for conveying sheet material, a longitudinally extending conveyer member embodying a discharge end, a traveling belt disposed to convey material along said conveyer member, a guide roller disposed adjacent to the discharge end and around which said conveyer belt is arranged to pass in its return travel, and a guide member arranged adjacent the outer side of said belt, said guide member having a forward portion positioned in advance of the discharge end and having a rearward portion extending adjacent to the discharge end, said roller and said guide member being mounted yieldably as a unit with respect to the conveyer member.

WALTER J. WRIGHT.