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B. BEARDSLEY
DOUBLE STRAP CONVEYER

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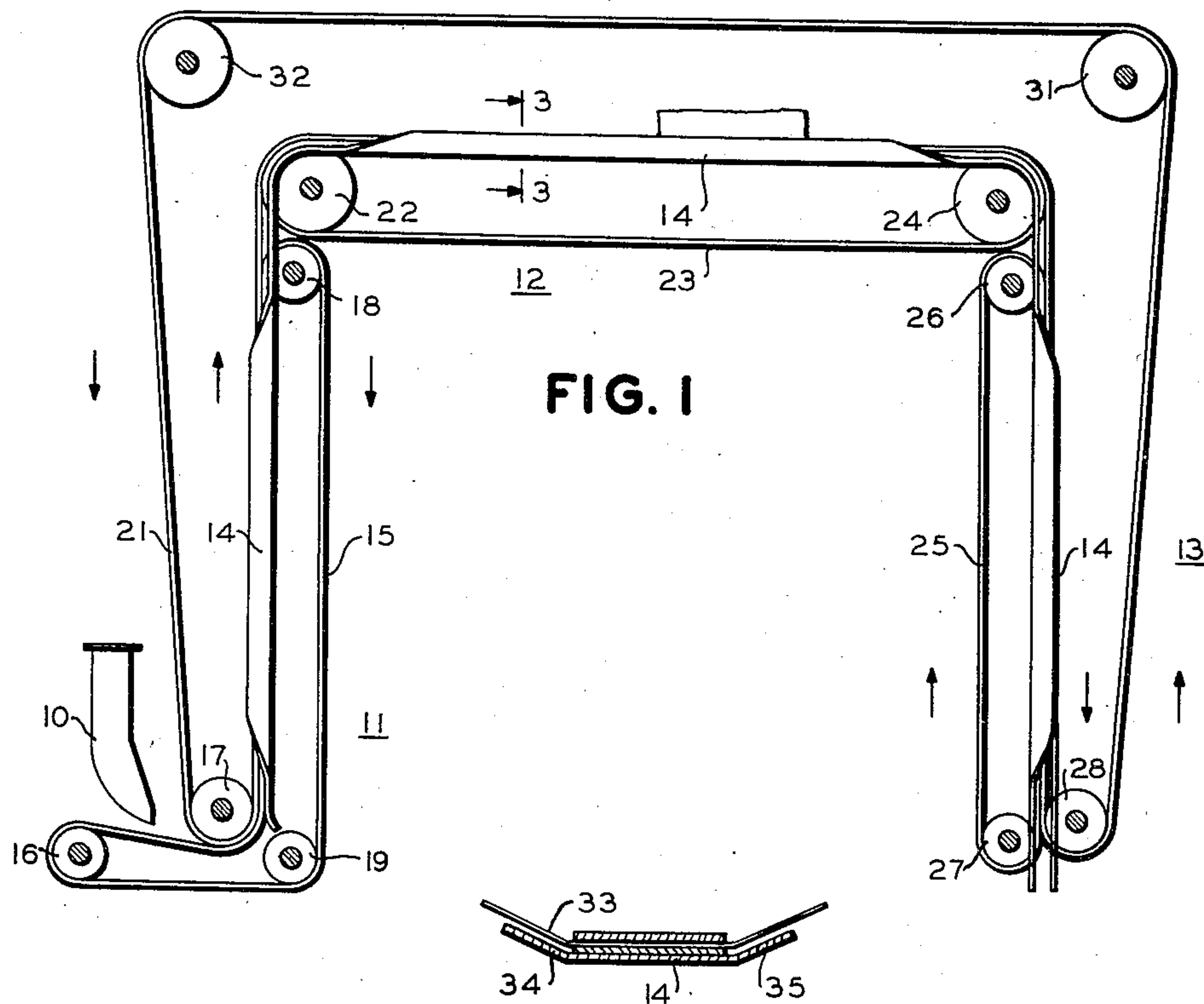


FIG. 3

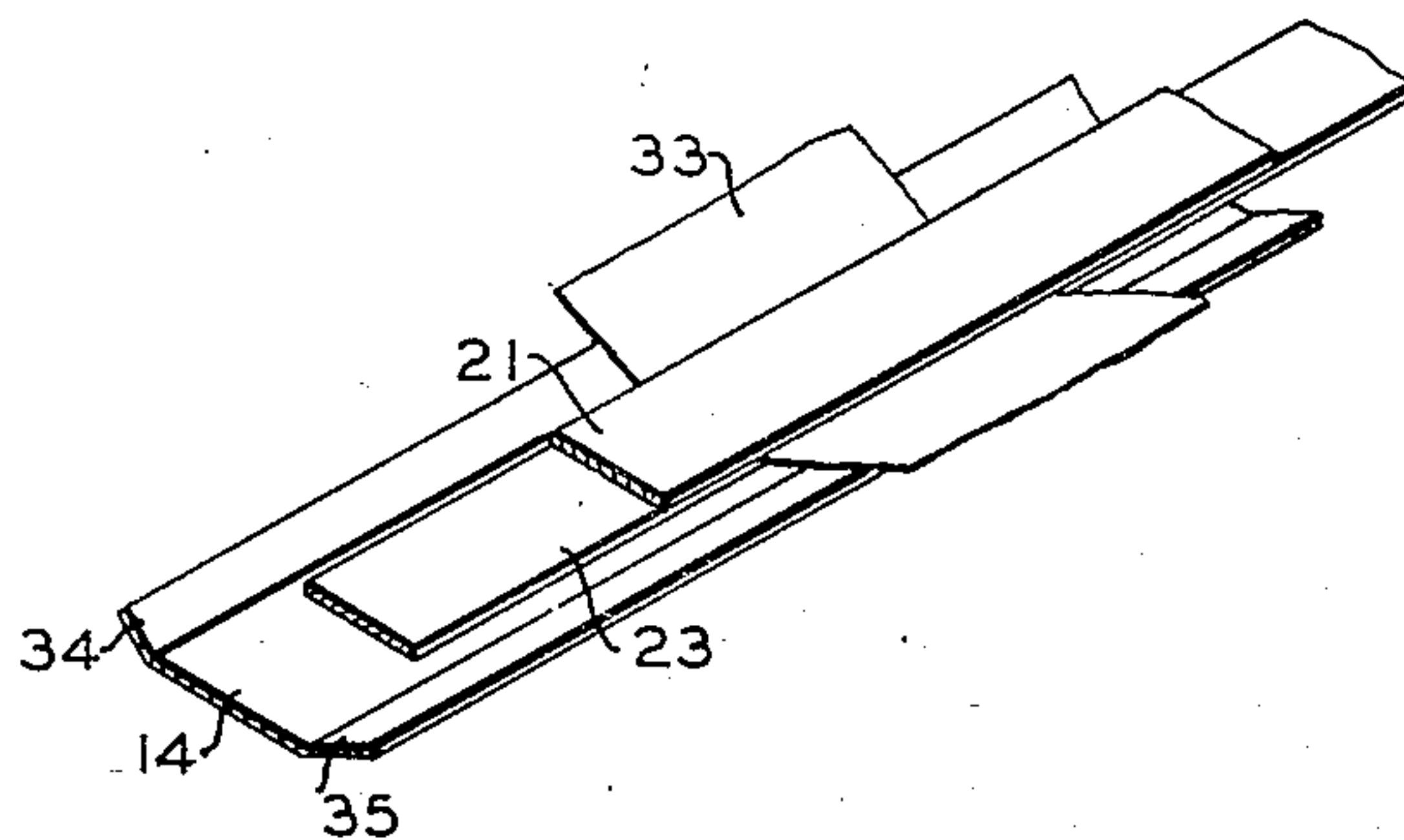


FIG. 2

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DOUBLE STRAP CONVEYER

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2 Claims. (Cl. 198—165)

This invention relates to double strap or double belt conveyers, more particularly to a form of this type of conveyer specially adapted to the conveyance of sheet material between the belts.

5 The principal object of this invention is to provide for double belt conveyers simplified means to support the belts along the intermediate portions of a conveyer run. Instead of twisting the belts or passing them in a zig-zag path over a number of rollers spaced at close intervals, the belts, according to this invention, are supported by a straight longitudinally extending member which supports the belts so that they travel along a straight line. The support member may take 10 various shapes and embody various means for providing transverse restraint for the belts. A particular advantage of this arrangement is that the support constrains one of the belts to travel in a predetermined plane so that along horizontal runs the weight of the upper belt will be effective to aid in holding the sheets between the belts as they travel and in vertical runs to restrict the separating movement necessary for the reception of material to the unconstrained belt.

20 Another object is to provide, in that special class of sheet material conveyers in which the conveying members are of less width than the sheet material being conveyed and along which the sheets travel with their edges overhanging the stationary or supporting member of the active conveyer elements, a pair of conveying elements traveling along the support member arranged to engage both surfaces of the sheets for the purpose of more effectively gripping the sheets to insure that they will be carried against the friction produced by the dragging of the overhanging portions of the sheets along the edge of the support member.

40 A further object of this invention is to provide in a double belt conveyer for sheets of greater width than the belts means for deflecting the portion of the sheets that overhang the edges of the belts out of the plane of the contacting conveying surfaces of the belts so as to render the grip of the latter upon the sheets more effective and at the same time provide lateral guide means for the belts and for preventing the sheets from slipping or working out from between the belts in a transverse direction.

50 These and other objects will more clearly appear from the following description and claims taken in connection with the accompanying drawing forming a part thereof, in which:

55 Fig. 1 is a diagrammatic elevation of a con-

veyer system according to this invention embodying a plurality of runs,

Fig. 2 is a view in projection indicating the position of the two belts or straps as they travel along the support carrying a sheet of material therebetween; and

Fig. 3 is a section taken along the line 3—3 of Fig. 1.

This invention is primarily devoted to the improvement of the type of conveyer illustrated and described in Patent 1,793,953, granted on February 24, 1931 to F. E. d'Humy et al., in which material is conveyed along a drag channel having upstanding side portions by a belt traveling along the central portion to convey sheets of material such as message blanks and the like between the belt and the channel by frictional engagement with the belt. The preferred embodiment of the present invention as illustrated in the drawing employs substantially the same type of conveyer channel or support. It is to be understood, however, that the invention is not limited to the type of support or associated elements illustrated in the drawing. It may be applied equally well to other types of support and guide arrangements.

This case is a continuation in part of an earlier filed application by me for Drag conveyers, Ser. No. 556,640, filed August 12, 1931, now Patent No. 1,985,850.

When the type of conveyer employing a single belt such as illustrated and described in the patent referred to above is utilized for conveying message blanks or the like to which the message, received on a gummed tape, has been affixed by moistening the tape and applying the same to the message blank, the presence of moisture and adhesive, particularly under conditions of high atmospheric humidity, causes messages to tend to stick and hesitate in their progress along the channel. A single belt traveling along a channel depends for its conveying action entirely upon the frictional engagement between the belt and the message blank. This may at times be insufficient to overcome the unusual conditions.

It has been found according to this invention that the difficulties just related may be overcome by the employment of two straps or belts traveling along the conveyer channel or support superposed one upon the other. The sheet material is inserted between the belts which provide traveling conveyer members engaging opposite faces of the blanks or sheets. This gives the required additional amount of gripping action for carrying them along channels in which they would other-

wise hesitate. This invention therefore is directed to the incorporation of such an arrangement in successful and useful embodiments.

Referring now to the drawing, for a more detailed description Fig. 1 shows a conveyer system in diagrammatic form embodying an inlet having a feeding chute 10 directing material such as sheets or message blanks into an initial vertical run 11 of the conveyer in which the sheets travel upwardly. This run connects with a horizontal run 12 which further feeds into a vertical run 13 in which the sheets travel downwardly. The various conveyer runs comprise channel or support members 14 forming a trough extending between directing changing rollers. The vertical run 11 embodies in addition to the channel or support member an inner belt 15 which travels along the face of the central portion of the support. In the embodiment illustrated the belt 15 passes around an initial roller 16 to the roller 17 at the inlet of the run and thence up the face of the support to the upper end roller 18. From there it returns downwardly in a vertical direction to roller 19, thence to the roller 16 and over the same route again. Traveling in a superposed position upon the belt 15 is a second belt 21. This belt passes around the inlet roller 17 adjacent the face of the roller, the belt 15 traveling in an outer position around the same roller. From thence it passes upwardly with the belt 15 to the roller 18 and continues on to direction changing roller 22. At this point it comes in contact with a second inner belt 23 which is coextensive with the horizontal run 12. The belt 23 travels in the inner position along with belt 21 until it reaches the further end of the run where it passes around the return or direction changing roller 24. At this point the belt 21 does not return with belt 23 but passes on downwardly along the run 13 as the outer belt of that run. The run 13 embodies an inner belt 25 which traverses the support 14 of that run and passes around rollers 26 and 27. The outer belt 21 upon reaching the lower extremity of the run 13 passes outwardly around return roller 28 and thence to its position of initial conveying contact over return rollers 31 and 32. Although the inner belt has been shown as sectionalized so far as this invention is concerned it may be a single belt.

It is well known that in double belt systems for conveying material between the belts which provide for supporting the belts on rollers alone the primary problem is keeping the belts together so as to prevent the material from falling out. Heretofore, either twisting the belts or passing them through or over a plurality of relatively closely spaced rollers in a zig-zag path has been resorted to. Nevertheless, in both of these arrangements the belts are liable to separation due either to vibration or uneven tension. It is clear that the belts when swinging freely between guide rollers must be maintained at all times in contact with the material so as to maintain their grip on the latter to prevent it from dropping out of the conveyers. Even the slightest amount of separation cannot occur without the possibility of the material working from between the belts and being dropped along the conveyer run.

However, according to this invention, as is apparent from the foregoing description, it is seen that an improved arrangement is provided for more effectively maintaining the two belts in constant contact with each other or increasing the friction between the opposite faces of the material

being conveyed and the belts by providing a continuous supporting member 14 disposed along the length of each conveyer run. As shown, each supporting member or channel is disposed in a plane tangential to the rollers carrying the inner belts 15, 23, and 25, respectively, and along a horizontal run supports the weight of the two belts, the inner belt traveling along the face of the supporting member and the outer belt resting in a superposed position on the inner belt. Along horizontal runs therefore the weight of the upper belt is effective to hold the two belts together and to grip the material conveyed therebetween. Along vertical runs the member 14 provides a steadying member which holds the belts in sustained contact along such runs and thus firmly grips the material at all times. This is true even though no actual weight may be supported upon the member 14. In both horizontal and vertical runs the provision of the stationary member 14 disposed so that the inner belt travels in continuous engagement with said member provides a means for constraining one of the belts to travel along a predetermined path thereby causing all of the deflections taking place when material enters between the two belts to take place in the outer belt alone. This in itself is sufficient to provide for an increased steadiness for the travel of the belts along the runs and also a more effective gripping of the material being conveyed between them.

It is proposed according to this invention to provide not only means for supporting both of the belts of a double belt conveyer system between direction changing rollers but also to provide means for engaging the overhanging edges of sheets of material which are of greater width than the conveying belts and deflect such edges out of the plane of the adjacent engaging faces of the belts. By referring to Figs. 2 and 3 it may be more clearly seen how the sheets of material 33 are engaged between the belts 21 and 23 and are deflected out of alignment with the inner faces of said belts by upstanding side members 34 and 35 which lift the overhanging edge portions above said plane of engagement. The members 34 and 35 are preferably integral with the central portion of the support member 14. They may be separate, however, and function properly.

The principal advantage of a deflecting arrangement arises from the fact that sheets deflected into a non-planiform shape may be more readily gripped between the two conveying members. This is accomplished largely by the portion of the sheet along the outer edges of the upper belt 21 being pressed more firmly into engagement with the edges. At the same time the bending action causes the intermediate area of the sheet lying between the belts to be more firmly pressed against the lower belt 23. In practice it has been found that this action has been sufficiently effective to produce substantially the same reliability of conveying action upon sheets of papers such as telegram blanks and the like along vertical runs of such a conveyer as along horizontal runs. In addition the deformation of the sheets increases their stiffness or rigidity therefore enabling them to better withstand the air resistance of the overhanging portions as they pass rapidly along the conveyer runs. In addition to this steadying effect, the longitudinally extending members decrease the tendency of the sheets to work out from between the conveyer belts.

From the foregoing description it will be observed that a simplified and more effective method of supporting a double strap or double belt conveyer has been provided in the form of a longitudinally extending member in continuous engagement with the belts intermediate of the direction changing or guide rollers. It will be seen that, in addition to the steadying effect of such guide members, by the use of a particular type of guide member embodying means to engage the overhanging portions of the sheets or by the provision of such engaging means in some other form, the effectiveness of a double strap conveyer is still further increased.

When compared with the methods heretofore employed in connection with double strap conveyer systems, it will be seen that the arrangement according to this invention has considerably simplified the means of supporting the belts along the various runs of a conveyer system and also the effectiveness with which the material is held between the two conveying belts.

On the other hand, in comparison with a single belt conveyer traveling along a continuous supporting member and arranged to function as what is known in the art as a drag conveyer, it has other special advantages. In the first place substantially all of the advantages of simplicity and cheapness of construction and effectiveness in retaining the conveyed sheets in position are preserved. In addition the advantage of a more firm gripping or engaging of the sheets between the two moving conveyer elements is provided. These and many other advantages of the invention described herein will appear to those skilled in the art.

It is to be understood that the forms the invention may assume without departing from the spirit of this invention are not to be limited to the form illustrated in the drawing. It is desired therefore that although only one embodiment of the invention has been illustrated only such limits as are imposed by the prior art or as are set forth in the appended claims be placed on this invention.

What I claim is:

1. A conveyer system for conveying sheets comprising a plurality of belts having their adjacent surfaces in contact and being of less width than the sheets to be conveyed, spaced supporting rollers for said belts and a supporting channel for said belts embodying means to deflect the overhanging portions of the sheets with respect to the contacting sheet-engaging surfaces of two of said belts, said channel being disposed in the plane tangential to the supporting rollers for the belt adjacent the channel to damp or minimize vibration of the belts in a direction normal to the contacting surfaces thereof without imposing substantial drag upon the belts.

2. A conveyer system for conveying sheets comprising a plurality of belts having their adjacent surfaces in contact, spaced supporting rollers for said belts and a stationary supporting member for said belts extending substantially the distance between the rollers and being disposed in the plane tangential to the supporting rollers for the belt adjacent the channel to damp or minimize vibration of the belts in a direction normal to the contacting surfaces thereof without imposing substantial drag upon the belts.

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