

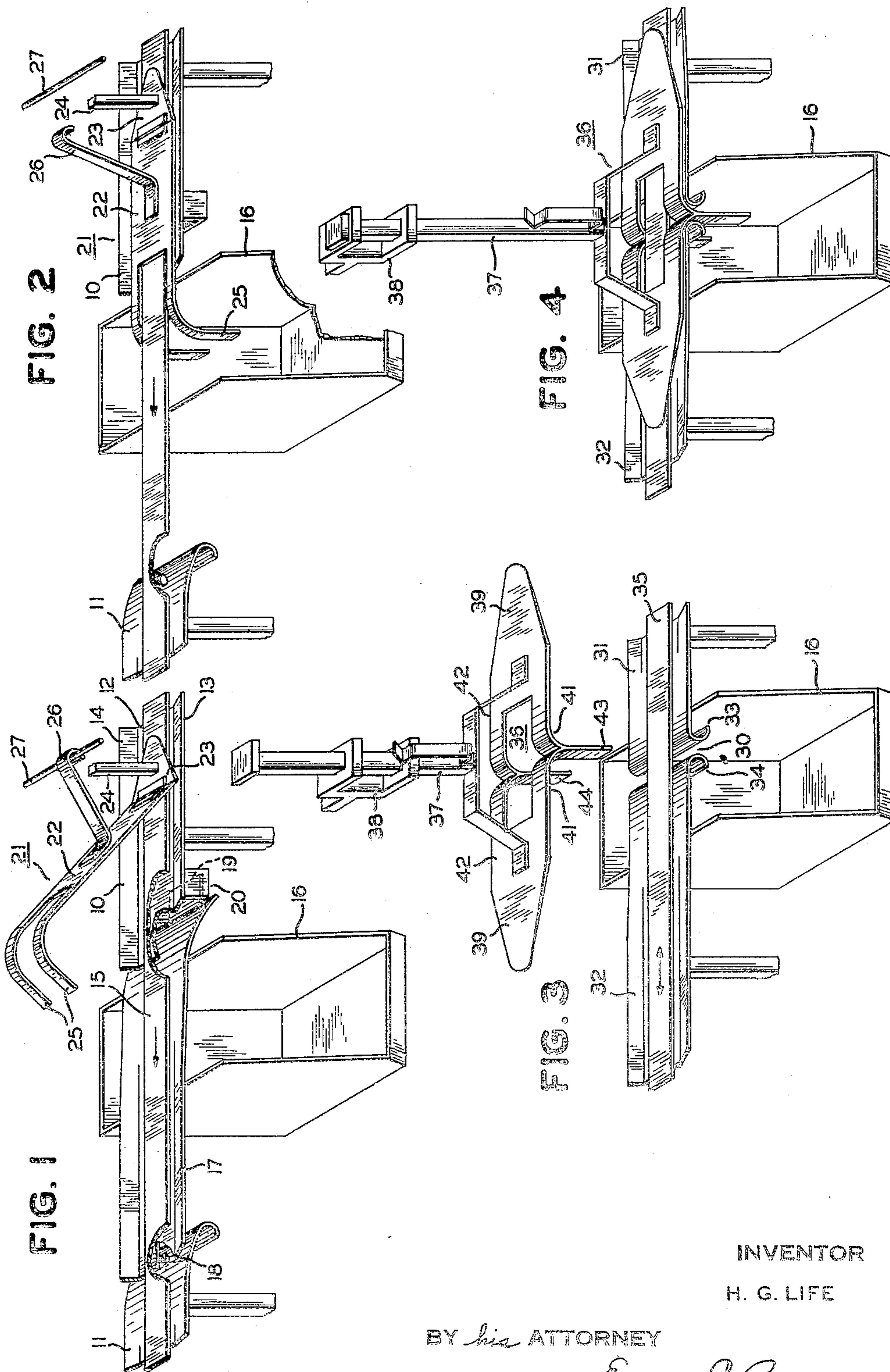
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DISCHARGE FOR DRAG CONVEYERS

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DISCHARGE FOR DRAG CONVEYERS

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This invention relates to conveyers for transporting sheet material, more particularly to conveyers of the drag type arranged for carrying the material between a conveyer channel and a belt traveling in frictional engagement therewith.

This invention has for an object to provide means for discharging sheets of material at one or more intermediate positions along the conveyer channel.

In certain instances, more particularly where a conveyer of the drag type is employed for the distribution of telegram blanks, messages and the like, it may be desirable to discharge message blanks from the conveyer at one point at certain times and at another point at other times. When it occurs that one or more of the desired discharge points is located along an intermediate section of the conveyer channel it is desirable that the conveyer should be arranged to discharge the material at said point or convey the material beyond the point to some other point of discharge without any interruption to the normal operation of the conveyer. According to this invention such an arrangement may be provided by an opening in the conveyer channel with means for causing the message blanks to be discharged through said opening or to continue across said opening when it is not desired that the material should be discharged at that point. Such an arrangement may embody a removable section of conveyer channel which is taken out for discharging material at that point in the channel and which is replaced when it is desired that the material should continue along the conveyer beyond that point. Another arrangement embodies a relatively short opening in the conveyer channel across which sheets of material will normally pass as they travel along the conveyer channel in combination with discharge deflector means which may be disposed at the opening to cause the sheets to pass through the opening and be discharged.

Another object of this invention is therefore to provide a discharge opening in an intermediate section of the conveyer channel and means cooperating with the discharge

opening to cause the material to be discharged thereat or to pass beyond the opening as desired.

These and other objects will be apparent from the following description taken in connection with the accompanying drawing forming a part of this application, in which:

Fig. 1 is a perspective view of an arrangement in which the discharge opening is bridged by a removable section;

Fig. 2 is a similar view with the bridging member removed;

Fig. 3 is a perspective view of an arrangement provided with a relatively short discharge opening and a cooperating deflector movable into position to cause material to be discharged at said opening; and

Fig. 4 is a similar view with the deflectors disposed in discharge position.

Referring to Fig. 1 the arrangement comprises a longitudinally extending conveyer channel 10 embodying a horizontal central section 12 with outwardly flaring side portions 13 and 14. A conveyer belt 15 is disposed to travel along the horizontal central portion of the conveyer channel in substantially continuous frictional engagement therewith for conveying sheets of material between it and the channel. However, other types of channel members may be employed.

In order to provide for discharging material at an intermediate point, the channel member 10 is terminated substantially vertically above a discharge receptacle 16. At a point longitudinally spaced from this terminus, the conveyer channel is continued with channel section 11. This space is bridged by a removable section 17. At the beginning of the continuation, the channel member 11 is flattened out and bent downward to form an inlet lip. The removable section is arranged to be supported on this lip and held in place by a pin or dowel 18. The other end of the removable section is supported by means of a tongue or extension 19 fitted into a stirrup member 20.

When it is desired to discharge material, section 17 is removed and a deflector member 21 is lowered from the position illustrated in Fig. 1 to that illustrated in Fig. 2 to direct

the sheets into the receptacle 16. The deflector member embodies a movable pivoted section 22 hinged to a stationary section 23 at the forward end of the deflector. The section 23 is held in spaced relation to the conveyor channel by being secured to a structural beam 24. The space between the deflector and the channel member is sufficient to permit the belt 15 to travel freely therebetween and to permit the overhanging edges of the sheets to pass between the outer edges of the deflector plate and the channel member. The rearward end of the deflector is slotted to form a pair of arms 25 spaced sufficiently apart to extend along opposite sides of the belt 15. The outer ends of the arms are curved downward toward the receptacle 16. The arms are extended outward horizontally a slight distance before being curved downward in order to permit the sheets which are held in a non-planiform shape as they travel along the channel to extend beyond the end of the channel member before being directed downward by the curved portions of the arms. However, this provision would be unnecessary if the outer end of section 10 were flattened out substantially as shown in the embodiment illustrated in Figs. 3 and 4.

At such times as it is not desired to discharge material at the break or opening in the conveyor channel the deflector member will be raised to inoperative position as shown in Fig. 1 and secured in such position by a retaining element 24 arranged to be hooked over a bar 27. The section 17 is then reinserted in place to bridge the opening as shown in Fig. 1. Sheets of material arriving at the bridged opening will pass over the removable section on to the continued part of the conveyor channel, thence to the desired destination.

This embodiment may be arranged to accommodate and discharge material of substantially increased bulk by spacing the fixed end 23 of the deflector plate a greater distance from the conveyor channel and by inclining the deflector so that its rearward end assumes substantially normal position at the discharge point. With such an arrangement, when material of increased bulk is to be discharged, the outward end of the pivoted section will merely rise to ride upon the belt as it rises to accommodate the material being conveyed.

Another embodiment of the invention is shown in Figs. 3 and 4. In this arrangement there is no removable section of the conveyor channel to provide for the discharge arrangement. Instead an opening in the nature of a slot 30, embodied between a section of the conveyor channel 31 extending in one direction, and another section 32 extending in the opposite direction provides a discharge point. The adjacent ends of the conveyor channels are flattened out and bent downwardly at

their tips to provide curved lips 33 and 34. The slot 30 is embodied between the downwardly extending curved lips. A receptacle 16 may be provided below the slot for catching the material discharged through the slot. A conveyor belt 35 travels along the central portion of the conveyor channel sections.

From the foregoing arrangement of the second embodiment as just described, it is obvious that if the leading edge of sheets of material traveling across the discharge opening or slot 30 were caused to be directed downwardly as they arrived at the slot, discharge of the sheets would occur. Provision is made for causing this to take place by a discharge deflector arrangement 36 supported on a bar or shaft 37 movable in a bracket 38 positioned to hold the deflector member vertically over the discharge slot 30 and arranged so that the deflector may be moved up and down to set the same into and out of operative position. The deflector member 36 comprises a pair of outwardly extending pointed plates 39 slotted at their inner ends to form a pair of arms 41 and 42, spaced apart at a distance slightly greater than the width of the belt 35. The arms 41 and 42 of the respective deflector plates are curved down from horizontal to a vertical position and joined together where they intersect to form a single pair of downwardly extending spaced members 43 and 44.

When it is desired to cause the sheets to be discharged through the slot 30 into the receptacle 16, the deflector member 36 is lowered from the position shown in Fig. 3 to that shown in Fig. 4. In the position shown in the latter figure, the arms 43 and 44 extend down through the slot 30 on opposite sides of the belt 35. While the horizontal pointed plates 39 are held in spaced relation to the channel sections 31 and 32 and above the belt 35, there is sufficient space between the deflector and the conveyor channel to permit the belt 35 to travel freely between the two members. It will be observed that in operative position the curved portion of the arms 41 and 42 are positioned with respect to the curved lips 33 and 34 to form a guideway or channel between the two members extending downward toward the receptacle 16. From this it will appear that sheets of material approaching the discharge opening 30 from either direction in which the conveyor belt 35 may be traveling will have their leading edges directed downwardly by the curved portion of the joined arms of the deflector and in this manner the whole sheet will be directed into the slot or opening 30 instead of continuing along the conveyor. The belt 35 being in substantially continuous contact with the bottom of the respective channel sections up to the opening, will carry the sheet forward through the discharge channel provided as set forth, causing the sheets to be

effectively discharged without any hesitation or interruption with the normal function of the conveyer belt.

When it is desired that the material should
 5 continue along the conveyer, the deflector is raised to the position shown in Fig. 3 permitting the material to be carried across the slot 30 by the traveling belt 35 instead of being discharged. The slot 30 being relatively
 10 narrow and the curved lips at the end of the adjacent conveyer sections providing smooth entrances from one conveyer section to the other, the leading edge of a sheet of material of ordinary size traveling at normal conveyer
 15 speed would pass across the slot and enter the adjacent conveyer channel before it has had time to drop down through the slot. This would be due both to the slight rigidity of the sheet of material between the traveling
 20 belt and the conveyer channel and also to the momentum of the sheet as it travels along the conveyer. It will be observed by referring to Figs. 3 and 4 that the adjacent ends of both of the channel sections 31 and 32 are
 25 formed substantially alike. From this it is apparent that the conveyer may be operated equally as effective to transport sheets in either direction, whereas, the embodiment shown in Figs. 1 and 2 provides for these
 30 sheets traveling in one direction only. It is obvious, however, that the first embodiment could likewise be adapted to carry sheets in either direction by suitably modifying the removable section of the conveyer 17 and also
 35 by disposing a discharge deflector arrangement at the end of the forwardly extending channel section 11.

It will be observed that envelopes, bulky bunches of sheets or the like could be dis-
 40 charged by this type of arrangement by suitably enlarging the opening 30 and correspondingly modifying the deflector arms of the member 36. Furthermore, the deflector member being movable up and down by
 45 means of the shaft and bracket arrangement 37 and 38, when a body of relatively bulky material arrives at the discharge which would not easily pass between the conveyer belt and the channel with the deflector in its
 50 normal position, the deflector readily rises from its normal position as the material enters the passageway between it and the channel and directs the material through the slot substantially as in the normal case. The
 55 binding as the material enters between the belt and the deflector plate could be cut down by constructing the deflector of relatively light material or providing a counterbalancing arrangement such as a tension spring or
 60 counterweight.

It will be observed that although I have shown the conveyer embodying this inven-
 65 tion as being disposed in a horizontal position, the arrangement would be equally as

effective if the conveyers were disposed in any other position.

It will be observed further that although the invention is shown as providing discharge
 70 means at an intermediate point in the conveyer, a similar arrangement might be employed to discharge sheets at the terminal of a conveyer where it is desired that the sheets of material be deflected abruptly from their
 75 normal course of travel as they leave the end of the conveyer. With a conveyer disposed to transport material in a substantially vertical direction, a discharge arrangement employing the principles of this invention
 80 might be employed to cause the sheets to be deflected or discharged from the conveyer belt sidewise into a suitable receptacle. It will be further observed that such a discharge arrangement will readily accommodate the
 85 discharge of material of varying bulk, a matter of significance in connection with the adaptation of this type of arrangement to various conditions.

From the foregoing description it will be noted that a conveyer discharge arrangement
 90 has been provided which may be adapted to discharge material either at any suitable intermediate point along a conveyer of the drag type or at the terminal of such conveyer.
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Although the invention has been illustrated as providing for the material to be carried
 100 along a conveyer channel one element of which is a stationary support, it is obvious that it is equally applicable to conveyers provided with other types of channels.

While this invention has been shown in but two forms, it is obvious to those skilled in the
 105 art that it is not so limited, but is susceptible of various other changes and modifications without departing from the spirit thereof, and it is desired, therefore, that only such limitations shall be placed thereon as are im-
 110 posed by the prior art or as are specifically set forth in the appended claims.

What I claim is:

1. In a drag conveyer for sheet material, the combination of a conveyer belt and a support along which the belt travels for con-
 115 veying sheet material between it and the support, said support being terminated near a point at which material may be discharged, yieldably supported deflector means adjacent said opening, said deflector means comprising
 120 a plate disposed at the outer face of the belt, said plate embodying lateral edges extending astride the belt to a point beyond the inner face thereof, said edges being disposed
 125 angularly from the inner face of the belt to form a surface for peeling the sheets of material from said inner surface and directing the sheets transversely away from the belt as they arrive at the discharge point.

2. In a conveyer for sheet material, the combination of a conveyer belt and a co-
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operating member for maintaining the sheets in engagement with the inner face of the belt, said member being discontinued at a discharge point, said belt being continued beyond said discharge point, and deflector means comprising a movably supported plate member disposed at the outer surface of the belt, said plate embodying a forwardly extending tapered section arranged to unfold sheets which may have become folded over the belt before arriving at the discharge point, said plate also embodying lateral edges extending astride the belt and beyond the inner face thereof to form a surface for peeling the sheets of material from the belt as they arrive at the discharge point.

3. In a conveyer for sheet material, the combination of a conveyer belt and a support along which the belt travels for conveying sheets of material between it and the support, said support being severed at a point in its intermediate portion to provide a discharge opening through which sheets of material may pass, deflector means shiftable into and out of said opening, said means being arranged when disposed in said opening to divert the sheets from the conveyer through the opening, means to support the deflector in operative and inoperative positions, and a removable section insertable between the ends of the support at said opening for bridging the same when the deflector means is in inoperative position.

4. In a conveyer for sheet material, the combination of a conveyer belt and a support along which the belt travels for conveying sheets of material between it and the support, said support being severed at a point in its intermediate portion to provide a transverse discharge opening through which sheets of material may pass and a deflector shiftable into and out of said opening, said means arranged when disposed in said opening to divert the sheets from the conveyer through the opening, the ends of said support adjacent said opening being, spaced apart a distance substantially less than the length of the sheets whereby when the deflector is in inoperative position the sheets of material will be conveyed across the opening with substantially no interruptions of their normal travel.

5. In a conveyer for sheet material, the combination of a conveyer belt operable to travel in either direction and a channel member embodying a central portion and upwardly flaring side portions, said belt being arranged to travel along said central portion for conveying sheets of material held in a non-planiform shape between it and the support, said channel being severed at a point in its intermediate portion to provide a transverse discharge opening through which sheets of material may pass, the ends of said channel at opposite sides of said opening

being similarly flattened out for permitting the sheets of material to assume a substantially planiform shape as they arrive at the opening, and deflector means embodying similar plate members extending in opposite directions and joined together to form, when disposed over said opening, means to divert the sheets of material from the conveyer through said opening when the conveyer belt is traveling in either direction.

6. In a conveyer for sheet material, the combination of a conveyer belt and a support along which the belt travels for conveying sheets of material between it and the support, said support being severed at a point along its intermediate portion to provide a transverse discharge opening through which sheets of material may pass, and deflector means shiftable into and out of said opening, said means being arranged when disposed in said opening to divert sheets of material from the conveyer through the opening, and means for movably supporting the deflector in said opening so that it may move upwardly from the support with the belt for accommodating the discharge of material of increased bulk.

7. In a drag conveyer for sheet material, the combination of a conveyer belt and a support along which the belt travels, for conveying sheet material between it and the support, said support being terminated near a point at which material may be discharged, deflector means adjacent said point comprising a plate disposed at the outer face of the belt and embodying lateral edges extending astride the belt and beyond the inner face thereof, said edges being disposed angularly from the inner face of the belt to form a surface for deflecting the sheets of material transversely away from the belt as they arrive at the discharge point.

8. In a conveyer for sheet material, the combination of a conveyer belt and a support along which the belt travels for conveying sheets of material between it and the support, said support being severed at a point in its intermediate portion to provide a transverse discharge opening over which sheets of material will normally pass but through which they may be discharged, a deflector embodying depending elements movable into said opening to divert the sheets from the conveyers therethrough, means for guiding the deflector from operative to inoperative position so that the depending portions move into and out of said opening with substantially no component of motion longitudinally of the support.

In testimony whereof, I affix my signature.
HAROLD G. LIFE.