Feb. 16, 1937. B. BEARDSLEY ET AL 2,070,822

BELT CONVEYER

Original Filed Dec. 31, 1931

FIG. 1

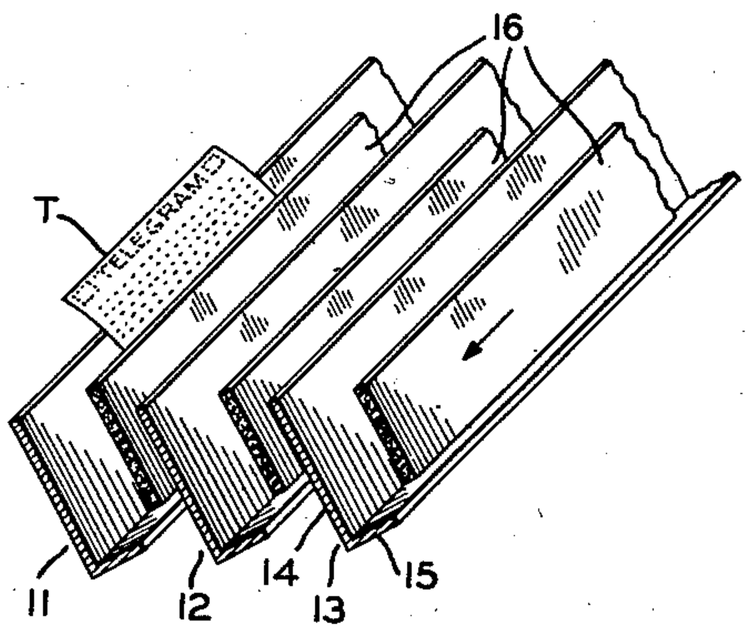
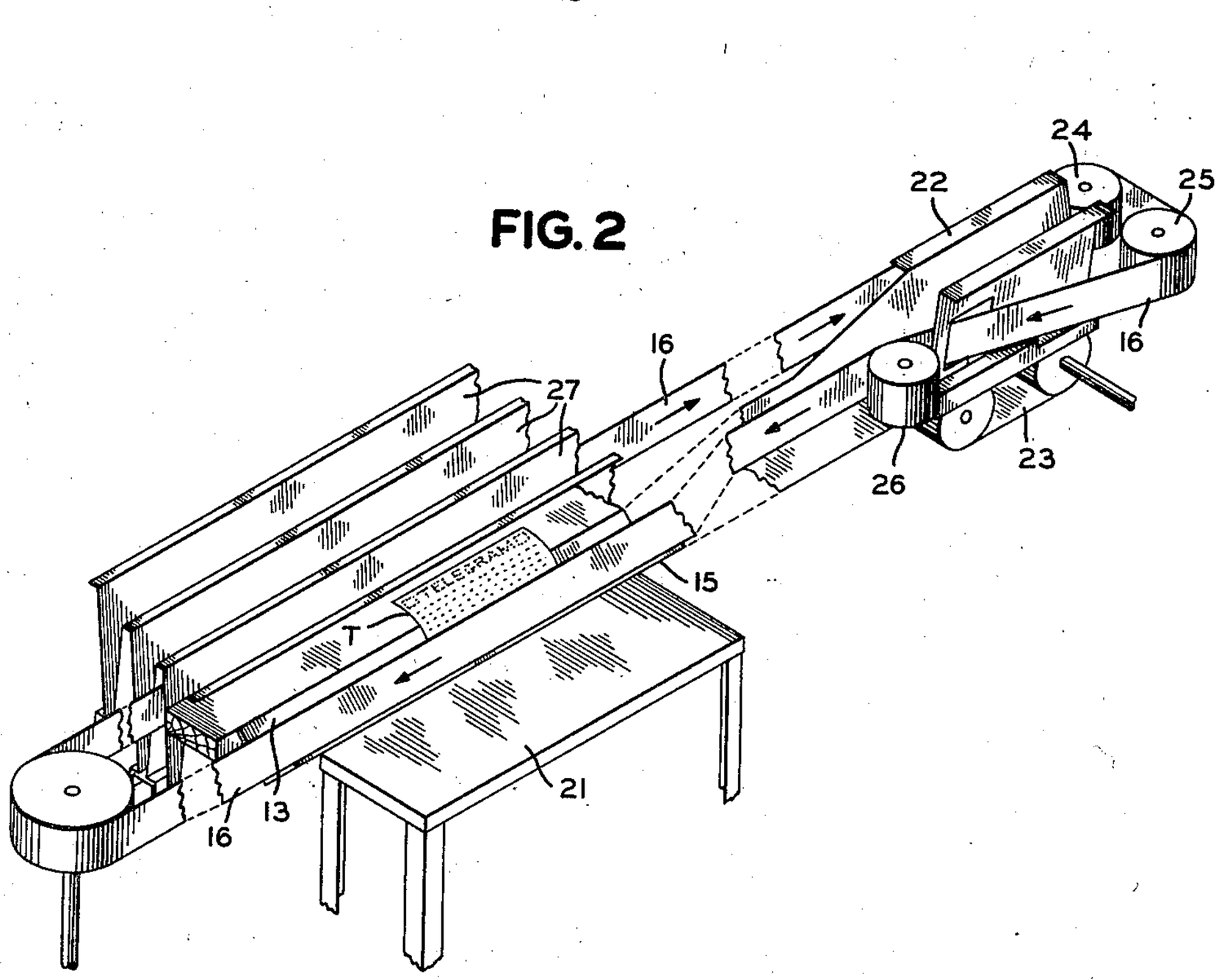


FIG. 2



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BELT CONVEYER

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10 Claims. (Cl. 198—160)

This invention relates in general to conveyer systems for handling sheet material, and more particularly to systems arranged to transport sheets of material in a substantially upright or on-edge position. This application is a division of application Ser. No. 584,204, filed December 31, 1931 now Patent 1,992,349, entitled Belt conveyers.

One of the objects of this invention is to employ a drag conveyer for transporting the sheets of material in an upright position with one edge of the sheets riding free or exposed beyond the conveyer channel, whereby the sheets may be easily grasped and withdrawn from the conveyer.

Another object is to accomplish a more compact arrangement of conveyers for sheet material by disposing the conveyers in an on-edge position, and by grouping the conveyer channels parallel to each other in substantially nested relation.

Still another object is to provide a special type of drag channel adapted particularly to be disposed in an on-edge position.

A still further object of this invention is to provide means for effectively supporting the conveyer belts, and maintaining the same in proper relation with the conveying surface of the channel of drag type conveyers when they are disposed substantially in an on-edge position.

A still further object is to provide a system including conveyers for feeding material into the on-edge conveyers, and other conveyers arranged to receive material withdrawn therefrom.

These and other objects are effected by our 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 detail view showing a special type of drag conveyer channel, particularly adapted to be disposed in an on-edge position, also a nested group of channels of this type; and,

Fig. 2 is a view of the special type of drag conveyer channel, illustrated in detail in Fig. 1, employed at a distribution center, and a feed from another conveyer disposed in an in-line position with the drag conveyer.

Heretofore, when it has been desired to convey sheets of material such as telegram blanks and the like in an upright position with one edge free, conveyers of the V-trough type have been employed. This type of conveyer is well known in the art and is in common use.

However, it has been found that a drag type conveyer disposed in an on-edge position has many advantages over the V-trough type in a system for handling sheets of material or message blanks, particularly for receiving messages from other conveyers and for conveying them to the so-called distribution center where they are sorted and rerouted to the desired destinations. One advantage is that when a message is inserted in a drag conveyer it is gripped by the conveyer and remains substantially in the same position as when it enters the conveyer system. This will enable messages to be placed in a definite position, for example with the address or other markings on the message in full view, so that upon arrival at the distribution center the messages may be readily withdrawn from the conveyers by sorting and rerouting clerks. In certain instances it has been found advisable to have certain designated clerks handle only certain types of messages, allowing messages of another class or type to pass by and be received by other clerks arranged along the distribution center. The new type of conveyer, carrying messages with the address or other marking suitably exposed above the top, makes it possible for a sorting clerk to select and withdraw from the conveyer particular messages as they are carried through the distribution center. Ordinarily, only one flat conveyer belt may be conveniently employed at the distribution center. This is because the conveyer belt feeding the messages into the distribution center is disposed between the sorting clerks and the outgoing or distribution conveyers, and therefore the amount of space occupied by the feeding conveyers determines largely the number of distribution conveyers that may be placed in easy reach of the sorting clerks between the feeding conveyers. Not only does the use of the compact drag type conveyer disposed on edge enable a larger number of distributing conveyers to be employed, but the drag conveyers themselves may be disposed close together in a nested arrangement, thereby making it possible to feed into the distribution center from a plurality of feeding conveyers.

Another advantage of the drag type over the V-trough type of conveyer is that it can be operated at a substantially higher rate of speed than the V-trough or open type.

In the common type of drag conveyer the channel members are substantially symmetrical in cross section and are arranged to convey the sheets with both the upper and lower edges extending out beyond the conveyer channel. However, in accordance with this invention, a channel is employed which permits the sheets to

extend outward only along the upper end of the channel.

Referring now to Fig. 1, we have shown a group of such channels arranged together in nested relation. The group comprises channel members 11, 12, and 13 arranged side-by-side and disposed closely adjacent each other. Each channel comprises a longitudinally extending L-shaped member embodying an upwardly extending back portion 14, and an outwardly extending leg portion 15. A conveyer belt 16 is arranged to travel along the channel with its inner surface substantially in engagement with the back portion, and its lower edge supported by the leg portion. In other words, the back portion provides the conveying surface of the channel member while the leg portion provides the supporting guide for the lower edge of the belt. Sheets of material such as telegram blanks T are inserted between the belt and the back portion of the channel and are carried along the channel by frictional engagement with the belt. The lower edges of the sheets ride along the guiding surface of the leg portion substantially in the same manner as the conveyer belt. Several channel members may be disposed parallel to each other as illustrated in Fig. 1 with the leg portions of the channels 11 and 12 engaging the back of the adjacent channels 12 and 13 respectively. In the preferred arrangement the channels are inclined backwardly so that the weight of the belt will provide the slight engagement that the conveying surface of the channel requires for suitably conveying the sheets along the channel without the necessity of springs or other guide members to hold the belt in place. However, the channels may be disposed in a vertical position and springs or other suitable guide members disposed in proper position for maintaining the belt in substantial engagement with the conveyer surface.

As already set forth, one of the particular advantages of the drag conveyer on edge for transporting messages, resides in the fact that the upper edges of the message blanks are exposed and the addresses or other suitable identifications on the messages or telegrams may be read at a glance, and sorting of the telegrams may be accomplished by clerks who sit at work tables or other supporting structure along which the conveyer extends, and who withdraw the telegrams and messages from the conveyer as they travel past their position. All that is required to make this possible is that the telegram blanks be inserted or fed into the conveyer with the address edge of the blank exposed above the conveyer. The blanks, being once placed into the conveyer in the proper position, will retain that position throughout the length of the drag conveyer run. In this manner an exceedingly compact arrangement of a plurality of conveyers for sheet material is obtained by a very simple and rugged construction. When this is compared with the types of conveyers heretofore employed for transporting sheet material in an upright position, it is readily seen that a considerable saving of space is accomplished.

Fig. 2 shows an arrangement at the distribution center in which a single feeding conveyer of the type shown in Fig. 1 is employed. The feeding conveyer channel 13 is arranged with its back away from the rear edge of the work table 21 so that as the conveyer belt 16 travels on the inner side of the channel nearest the table, a message blank T with its address faced toward the belt will be in position to be read by a sorting clerk working at the table. In the rear of the feeding conveyer are a number of distribution conveyers of the V-trough type in which telegram blanks T are dropped by the sorting clerk after they are removed from the feeding conveyer 13. From the distribution conveyers they are transported to their proper destination. By a suitable arrangement of the belt guide rollers several feeding conveyer channels 13 may be located at the back of the table. They could be arranged in nested relation substantially as shown in Fig. 1.

At the right of the distribution center illustrated in Fig. 2, is a special arrangement for feeding message blanks into the conveyer channel 13. The channel member is extended at one end and connected to one side of a V-trough conveyer 22. The V-trough conveyer channel may be of any desired length. However, only a relatively short length is illustrated. The V-trough conveyer channel 22 is provided with a conveyer belt 23 arranged to travel along the bottom of the channel in a well known manner. The channel is open at the top so that message blanks may be dropped into the same and be carried forward by the travelling belt 23. The belt 16 of the feeding conveyer is arranged, by means of guide rollers 24, 25, and 26, to extend through one side of the V-trough channel and across the channel and forward along the other side to a point substantially in engagement with the side. As already stated, this side of the V-trough channel is connected directly to the feeding conveyer channel 13, or in other words forms a continuous element therewith. The conveyer belt 16 is supported horizontally along its lower edge by the outwardly extending portion 15 of the channel member 13. Message blanks T, which are deposited into the open section of the V-trough 22, are carried forward until they engage the portion of the belt 16 as it passes across the end of the channel and around the guide roller 26. When the blanks reach the guide roller 26 they will be brought over to the extended side of the channel and will be held against the conveyer belt 16, due to its contact with the side of the channel, causing the sheets to be conveyed forward as in any other portion of a drag conveyer. Other provision may be made, however, for feeding material into this type of drag channel. The types of feed-in described in connection with the other type of drag channel herein set forth, may be suitably modified to feed into this type of channel also.

With the arrangement just described a larger number of distribution conveyers 27 may be employed, and the work table 21 may be omitted. The omission of the work table makes it possible to locate this larger number of distribution conveyers within easy reach of the sorting clerks. When the feeding conveyers bring message blanks in with the address readily visible, there is little need for a work table surface to accomplish the sorting. The message blanks can be withdrawn one by one from the feeding conveyer and deposited immediately in the proper distribution conveyer without having to lay the blanks upon a work surface to disentangle the same. From this it will be seen that the capacity of the distribution center may clearly be increased without any complication of the arrangement of the apparatus.

From the foregoing description it will be observed that a conveyer system for the collection

and distribution of sheet material such as messages or telegram blanks has been provided in which the messages are transported quickly and in definite order to the distribution center and in which the arrangement of the distribution center permits the handling of the maximum amount of messages in a given space. Also, it will be observed that a message distribution center has been provided employing a plurality of conveyers feeding messages into the center instead of one conveyer as heretofore. It will further be observed that the novel type of drag conveyer channel herein set forth is especially adapted to be employed as a feeding conveyer in connection with a distribution center.

Although we have shown our invention in several forms, it will be obvious that it is not limited to the forms described, but is susceptible to various other changes and modifications without departing from the spirit thereof, and we 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 we claim is:

1. In a conveyer for sheet material, the combination of a drag channel comprising a back portion, an outwardly flaring side portion joined thereto, and a belt travelling along said channel in engagement with the back portion for conveying sheet material between it and the back portion, said channel side portion being arranged to provide a lateral guide for both the belt and the sheet material.

2. In a conveyer for sheet material, the combination of a travelling belt and an L-section drag channel comprising an upstanding back portion providing a conveying surface in engagement with which the face of the belt travels and a ledge portion providing a lateral guide at one edge of the belt, said belt being of less width than the width of the sheets to be conveyed and being arranged to engage the lower portion of the sheets and permit their upper edge only to ride free.

3. In a conveyer system for sheet material, the combination of a plurality of longitudinally extending drag channel members arranged in side-by-side relation, said channel members comprising a back portion and an outwardly extending ledge portion joined thereto, belts, corresponding to each channel, arranged to travel in engagement with the back portion for conveying sheets of material between the belts and back portion, said channel ledge portions being arranged to provide a support for one edge of the belt and to serve as a lateral guide for the sheet material.

4. In a conveyer system for sheet material, the combination of a plurality of longitudinally extending drag channel members arranged in side-by-side relation and comprising a substantially vertical back portion and an outwardly extending ledge portion joined along the lower edge of said back portion, belts, corresponding to each channel, arranged to travel in engagement with the back portion, said channel ledge portions being arranged to provide a lateral guide for the lower edges of the belt and sheet material.

5. In a conveyer system for sheet material, the combination of a plurality of longitudinally extending drag channel members comprising an upwardly extending back portion and, extending outwardly from the lower edge thereof, a ledge portion, said channel members being arranged in side-by-side relation, with the outer edge of the ledge portion abutting the back portion of the adjacent channel member, forming a runway therebetween and a lateral guide for the lower edge of the sheet material, belts, corresponding to each channel member, supported by the ledge portion and arranged to travel in substantially on-edge position in said runways, said channel members being tilted backwardly at a substantial angle to the vertical so that a component of the gravitational force acts to hold said belts in substantial engagement with the back portion, whereby sheets of material disposed between the belts and back portions will be carried along said channel members by frictional engagement with said belts.

6. A conveyer system for sheet material, embodying a sorting center with one or more sorting positions, including one or more drag conveyers arranged adjacent said sorting positions, each of said conveyers comprising a channel member having a rearwardly inclined back portion of less width than the sheets to be conveyed and, extending outwardly along the lower edge thereof, a ledge portion, belts, corresponding to each channel, disposed with their lower edge laterally supported by said ledge portion and one face thereof travelling in substantial engagement with said back portion, whereby a sheet, travelling between the belt and the back portion, will be limited in its downward movement by said ledge portion and thereby caused to travel with its upper edge exposed above the back portion and, due to the inclination of said back portion, will tend to turn rearwardly so that indicia placed along the upper edge of the sheet is better exposed to view.

7. A conveyer system for sheet material embodying a drag conveyer, said conveyer comprising a channel member having an upwardly extending back portion and, extending along the lower edge thereof, a ledge portion, a belt arranged with its lower edge laterally supported by said ledge portion and one face thereof travelling in substantial engagement with said back portion, means for feeding sheets into one end of said drag conveyer comprising conveying means arranged to deliver the sheets substantially on-edge with their lower edge substantially in alinement with the ledge portion of the drag conveyer at the point of entrance, and to carry the sheets forward into the drag conveyer until they are engaged between the belt and the back portion of the channel member.

8. In a conveyer system for sheet material embodying a sorting center with one or more sorting positions, the combination of a plurality of V-trough distributing conveyers, a drag conveyer disposed between said distributing conveyers and said sorting positions, comprising an upwardly extending back portion, and a ledge portion projecting outwardly along the lower edge thereof, and an endless belt arranged to travel in an on-edge manner along said drag conveyer ledge portion and to return between said V-trough conveyers.

9. In a conveyer system, a longitudinally extending conveyer adapted to transport sheet material in a substantially vertical position comprising a V-trough conveyer channel, and a conveyer element adapted to travel in the base of the trough, said V-trough channel being extended along its back portion to form a drag conveyer channel comprising a substantially upright back portion and an outwardly projecting ledge portion substantially in line with said conveyer ele-

ment, a second conveyer element arranged to engage material delivered by said V-trough conveyer and to carry the same forward along said drag conveyer channel in a substantially vertical position.

10. In a conveyer system, a conveyer adapted to transport sheet material in a substantially vertical position comprising a V-trough and a conveyer belt element adapted to travel in the base of the trough, an on-edge drag conveyer channel extending longitudinally from the open end of said V-trough conveyer and comprising a substantially upright back portion formed by extending the back portion of said V-trough, and an outwardly projecting ledge portion substantially in the same horizontal plane as said conveyer element, a second conveying element arranged to travel along said drag conveyer, and guide means disposed at the juncture of said conveyers for transferring material from said V-trough conveyer into said drag conveyer whereby said material is caused to travel upright along a horizontal path.

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