

Jan. 21, 1936.

J. T. NEEDHAM

2,028,236

BELT CONVEYER

Filed Sept. 2, 1933

Fig. 1.

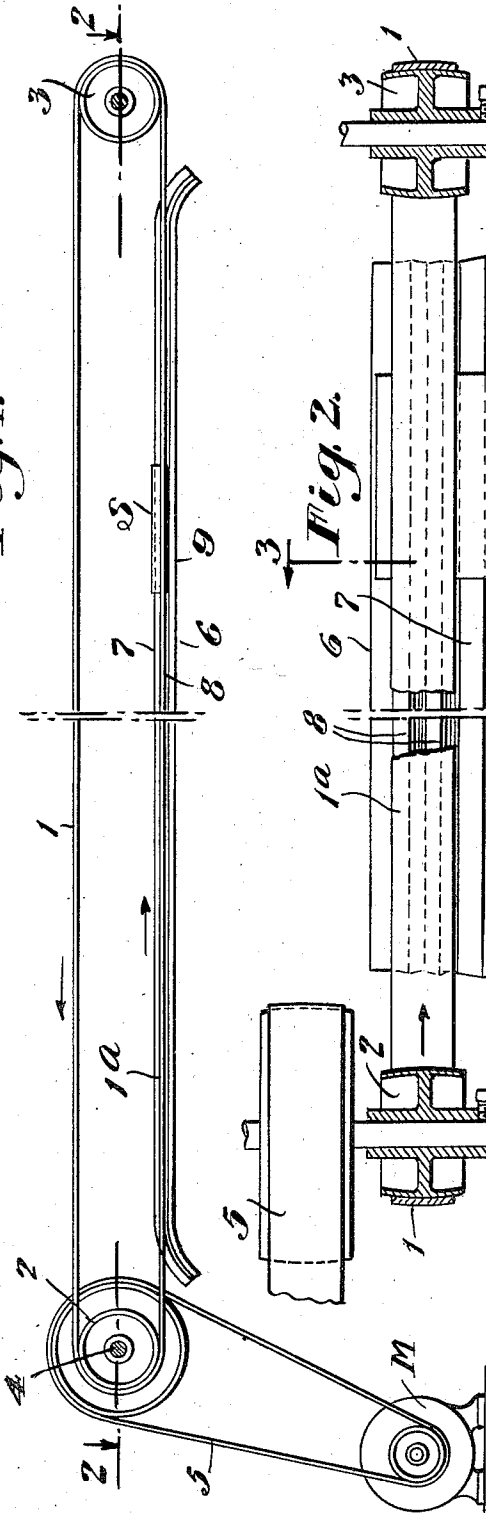


Fig. 2.

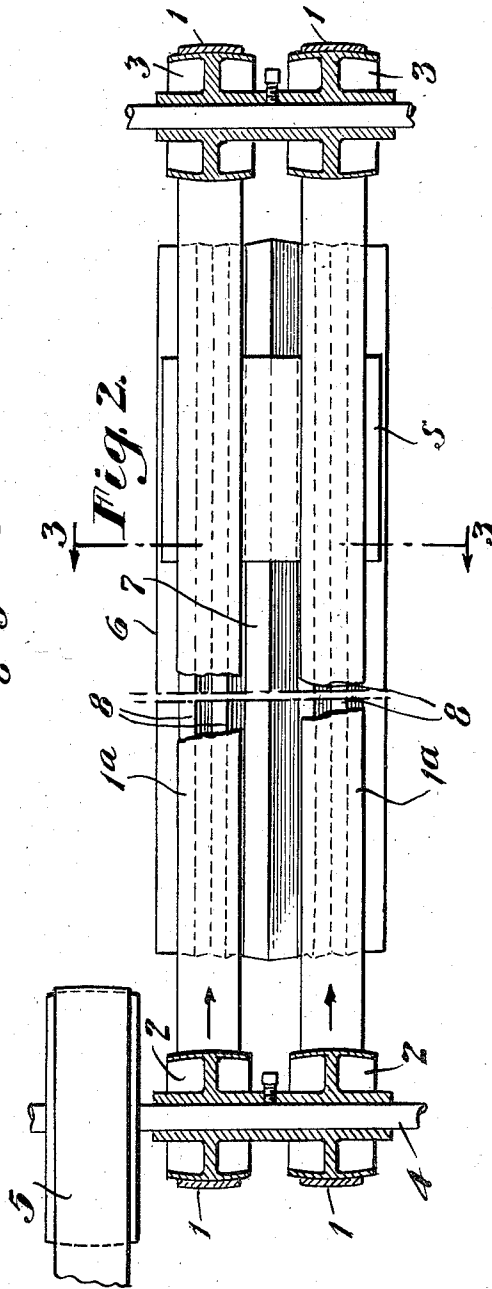
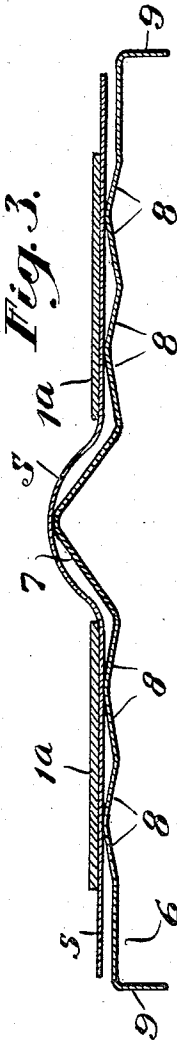


Fig. 3.



INVENTOR
JOHN T. NEEDHAM

BY *Samuel Davis*

ATTORNEYS

UNITED STATES PATENT OFFICE

2,028,236

BELT CONVEYER

John T. Needham, North Plainfield, N. J.

Application September 2, 1933, Serial No. 687,947

12 Claims. (Cl. 198—160)

This invention relates more particularly to drag belt conveyers of a type employed to convey sheets, such as telegram sheets, for example.

In such a conveyer a drag belt travels along a track which holds the sheets to the conveyer face for drag transport along the track. In prior drag conveyers of this type the drag transport of the sheets is often impeded by frictional resistance due to excessive area of contact of the sheets with the track and due also to accumulation of dirt on the track.

Important objects of the present invention are to provide an improved drag belt conveyer designed to reduce frictional resistance to drag conveyance and to provide a drag belt conveyer with an improved track surface which may be readily kept clean and smooth to facilitate drag transport of conveyed matter therealong by the belt.

Other objects of the invention will appear hereinafter.

In the drawing, Fig. 1 is a diagrammatic side elevation of a drag belt conveyer line embodying the invention;

Fig. 2 an enlarged longitudinal section on the line 2—2 of Fig. 1; and

Fig. 3 an enlarged cross section on the line 3—3 of Fig. 2.

The invention is illustrated as embodied in a drag belt sheet conveyer of the type disclosed in a co-pending U. S. patent application of Walter Jacob Mann, Serial No. 512,914, filed February 2, 1931. In said conveyer a plurality of companion drag belts run along parallel tracks to convey a sheet along both tracks with a medial portion of the sheet bridging the space between the belts. Between the tracks there is a ridge projecting between the belts to flex said medial portion of the sheet out of the plane of the tracks and thereby hold the sheet against lateral displacement and also keep it in better frictional contact with the belt. The present invention may, however, be employed to equal advantage in other types of drag conveyers.

The conveyer line illustrated includes a pair of companion flat conveyer belts 1 trained by pairs of coaxially disposed pulleys 2 and 3 to provide conveyer reaches 1^a running side by side along the line in transversely spaced, parallel relation. The pulleys 2 are fixed to a shaft 4, and a motor M has a driving connection 5 with said shaft, to drive the belt reaches 1^a in the same direction and at the same speed. Sheets are held to the conveyer faces of the belt reaches 1^a by means forming tracks for said belt reaches and for the

sheets. In the present instance said means comprise an elongated plate 6 of rather stiff sheet metal. Along a longitudinal central line said plate is bent to form a sheet flexing ridge or rib 7 tapering toward its crest in cross section and projecting between the belt reaches 1^a. At opposite sides of said central ridge the plate is bent along parallel longitudinal lines to form track ridges or ribs 8 projecting in the same direction as the central ridge but of materially less height. Said track ridges also taper toward their crests and the crests are all in the same plane. The crests may be slightly rounded as indicated. Preferably there are at least two of the track ridges at each side of the central ridge and their crests are directly opposed to the conveyer face of the adjacent belt reach and normally in contact with said face along the conveyer line.

The ridging of the track-forming plate interrupts the bearing surface of the tracks crosswise and thereby greatly reduces the area of track contact with the belt and with a transported sheet. The ridges of each track define a channel therebetween directly beneath the conveyer face of the opposed belt, and the crests of the ridges stand out from the body of the plate at opposite sides of the ridges. The belts have drag contact with the tracks only at the narrow crests of the ridges, along parallel lines spaced inward from the belt edges. In transportation a sheet, indicated at S, is held to the conveyer faces of both belts by the ridges 8 of the two tracks. The medial portion of the sheet is flexed by the central ridge 7 out of the plane of the tracks to hold the sheet against lateral displacement and to secure better contact with the belts. One face of the sheet is engaged by the full width of the belts while the opposite face of the sheet is engaged by only the narrow crests of the ridges. Consequently the frictional hold of the belt on the sheet greatly exceeds that of the tracks and the belts are enabled to positively transport the sheet along the tracks.

Conveyer belts pick up much dirt and in drag conveyers having flat belt tracks much of this dirt is deposited on the tracks where it increases the frictional resistance to belt travel and often causes the sheets to stick to the track. The present invention eliminates most of this trouble. Only the ridge crests of the track plate contact with the belt and the sheet, and little or no dirt picked up by the belts can lodge upon the narrow ridge crests. Furthermore, the track plate is designed to facilitate cleaning of the tracks in case any adhesive matter should cling to the ridges.

The outer margins of the track plates are disposed in a plane below the track ridges and below the conveyor faces of the belts to afford clearance for lateral entry to the tracks. There are no obstructions along the outer edges of the tracks so that a cloth can be readily inserted beneath the belts to wipe off the track ridges. To stiffen the track plate its outer margins may be turned downward to form longitudinal flanges 9, or they may be curled or beaded.

Supporting structure to hold the track plate in cooperating relation to the belts has been omitted from the drawing to simplify the illustration. The track plate and the shafts of the pulleys may be supported by any suitable structure, such as that disclosed in the aforesaid co-pending application, Serial No. 512,914, for example. Features of the present conveyor shown and described but not claimed in the present application are claimed in said co-pending application.

What I claim is:

1. A drag belt sheet conveyer line comprising a pair of companion conveyer belts trained to run side by side along the line in transversely spaced relation and each having a sheet-engaging conveyor face; and sheet guiding and supporting track means to hold an interposed sheet to both belts for drag conveyance along the line with a medial portion of the sheet bridging the space between the belts and including a central rib extending along the line and projecting between the belts to flex said medial portion of the sheet therebetween, and track forming ribs at opposite sides of said central rib and of less height than the latter and extending along the line with their crests directly opposed to said belt faces to hold the sheet to the belts for drag conveyance along said crests the crests of said tracks forming ribs being narrow in comparison with said opposed faces of the belt.

2. A drag belt sheet conveyer line comprising a pair of companion conveyer belts trained to run side by side along the line in transversely spaced relation and each having a sheet-engaging conveyor face; and sheet guiding and supporting track means to hold an interposed sheet to both belts for drag conveyance along the line with a medial portion of the sheet bridging the space between the belts and comprising a plate formed of sheet material bent along parallel longitudinal lines to form a central ridge extending along the line and projecting between the belts to flex said medial portion of the sheet therebetween and to form track ridges at opposite sides of said central ridge and of less height than the latter and extending along the line with their crests directly opposed to said belt faces to hold the sheet to the belts for drag conveyance along said crests the crests being narrow in comparison with the width of the opposed belt faces.

3. A drag belt sheet conveyer line comprising a pair of companion conveyer belts trained to run side by side along the line in transversely spaced relation and each having a sheet engaging conveyor face; and sheet guiding and supporting track means to hold an interposed sheet to both belts for drag conveyance along the line with a medial portion of the sheet bridging the space between the belts and including a central rib extending along the line and projecting between the belts to flex said medial portion of the sheet therebetween, and track forming ribs at opposite sides of said central rib of less height than the latter and extending along the line with their

crests directly opposed to said belt faces to hold the sheet to the belts for drag conveyance along said crests, the crests being narrow in comparison with the width of the opposed belt faces and the sheet guiding and supporting means having lateral clearance along its opposite outer longitudinal edges for lateral entry to the track forming ribs to clean them.

4. A drag belt sheet conveyer line comprising a track extending along the line and having longitudinal track ribs, a drag conveyer belt trained along said track and having a conveyor face directly opposed to the crests of said ribs to convey an interposed sheet along the rib crests, the crests being narrow in comparison with the width of said belt face, and the line being laterally open along and across an outer side edge thereof in the plane of the belt for access to the rib crests beneath the belt to clean the crests.

5. A drag belt sheet conveyer line comprising a track extending along the line and having substantially parallel longitudinal track ribs each tapering in cross section toward its crest, and a drag conveyer belt trained along said track and having a conveyor face directly opposed to the crests of said ribs to drag an interposed sheet long said crests, the crests being narrow in comparison with the width of said belt face, and the line being laterally open in the plane of the ribs across and along an outer side edge of the line to afford access to the ribs for cleaning them.

6. A drag belt sheet conveyer line including a track extending along the line and comprising an elongated sheet of stiff material bent along longitudinal lines to form substantially parallel track ribs along the line, and a drag conveyer belt trained along said track and having a conveyor face directly opposed to the crests of said ribs to drag an interposed sheet along the crests, the crests being narrow in comparison with the width of said belt face, and said track sheet being formed outward of the ribs to leave the line laterally open therealong in the plane of the belt to permit access to the rib crests beneath the belt to clean the crests.

7. A sheet conveyer line comprising cooperating belt conveyer means and track means both extending along the line and disposed in opposed face to face relation for conveyance of an interposed sheet along the track means by the belt means, the track means comprising transversely spaced track ribs with crests narrow in comparison with the width of the conveyor face of the belt means and directly opposed thereto to hold a sheet to the belt means for conveyance along said crests by the belt means, and a sheet-flexing ridge extending along the line between said track ribs to engage and hold the medial portion of the sheet flexed out of the plane of the rib crests as the sheet is conveyed, to prevent transverse displacement of the sheet across the rib crests, one of said two cooperating means having medial clearance therealong for the crest of said ridge.

8. A sheet conveyer line comprising cooperating belt conveyer means and track means both extending along the line and disposed in opposed face to face relation for conveyance of an interposed sheet along the track means by the belt means, the track means comprising transversely spaced track ribs with crests narrow in comparison with the width of the conveyor face of the belt means and directly opposed thereto for conveyance of a sheet along said crests by the belt means, and sheet-flexing means extending along the line and disposed between said ribs to hold

the medial portion of the sheet flexed out of the plane of the rib crests as the sheet is conveyed, to prevent transverse displacement of the sheet across the rib crests.

5 9. A drag belt sheet conveyer line comprising a pair of companion conveyer belt portions trained to run side by side along the line in transversely spaced relation and each having a sheet-engaging face; and sheet-guiding and supporting track means to hold an interposed sheet to both of said belt portions for drag conveyance along the line with a medial portion of the sheet bridging the space between the belt portions and comprising a track plate formed of sheet material bent along parallel longitudinal lines to form a central ridge extending along the line and projecting between the belt portions to flex said medial portion of the sheet therebetween and to form track ridges at opposite sides of said central ridge, of less height than the latter and extending along the line with their crests directly opposed to said belt faces to hold the sheet to the belt portions for drag conveyance along said crests, the track ridges tapering toward their crests in cross section, the crests being narrow in comparison with the width of the opposed belt faces and the track plate being formed outward of the track ridges to leave the line laterally open therealong in the plane of the belts to permit access to the track ridge crests beneath the belt portions to clean the crests.

10. A belt sheet conveyer line comprising a track structure including a central rib extending along the line and a sheet track at each side of said central rib and comprising track ribs extending therealong in substantially parallel relation to each other and to the central rib and having narrow crests disposed below the level of the crest of the central rib; and conveyer belt means opposed to said ribbed tracks to hold a sheet to

both tracks for conveyance therealong with a medial portion of the sheet flexed out of the plane of the track rib crests by the central rib.

11. A belt sheet conveyer line comprising a track plate formed of sheet material bent along parallel longitudinal lines to form a central ridge extending along the line and sheet track ridges at opposite sides of said central ridge and with narrow crests disposed below the crest of the central ridge; and conveyer belt means trained to hold a sheet to the crests of the track ridges at both sides of the central ridge for conveyance therealong with the medial portion of the sheet flexed out of the plane of the track ridge crests by the central ridge.

12. A drag belt sheet conveyer line comprising a pair of companion conveyer belt portions trained to run side by side along the line in transversely spaced relation and each having a sheet-engaging face; and sheet guiding and supporting track means to hold an interposed sheet to both of said belt portions for drag conveyance along the line with a medial portion of the sheet bridging the space between the belt portions and comprising a track plate formed of sheet material bent along parallel longitudinal lines to form a central ridge extending along the line and projecting between the belt portions to flex said medial portion of the sheet therebetween and to form a plurality of track ridges at each side of said central ridge of less height than the latter and extending along the line with their crests directly opposed to said belt faces to hold the sheet to the belt portions for drag conveyance along the said crests, the track ridges tapering toward their crests in cross section and the crests being narrow in comparison with the width of the belt faces opposed thereto.

JOHN T. NEEDHAM. 40