Aug. 13, 1940. O. C. CURRIE 2,211,648

CONVEYER ELEMENT

Filed March 6, 1939

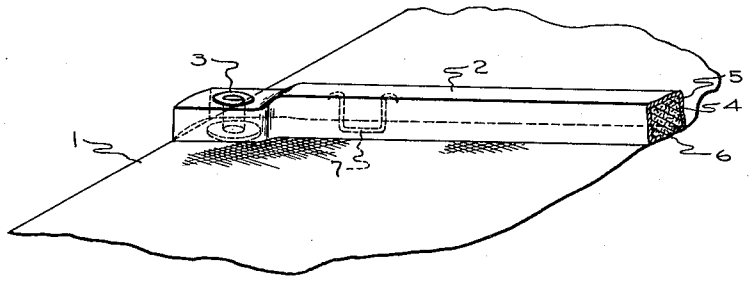


Fig. 1

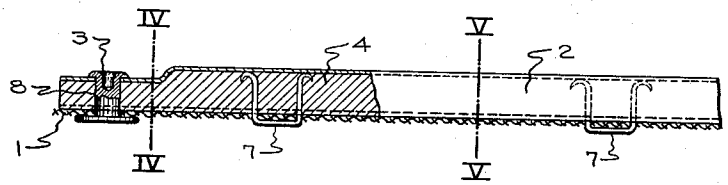


Fig. 2

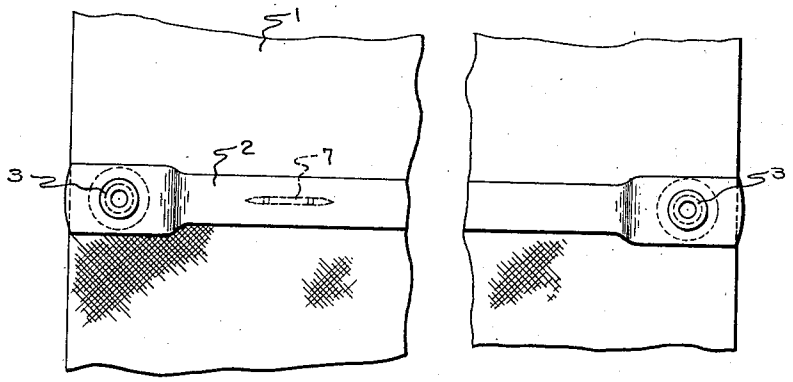


Fig. 3

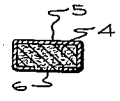


Fig. 4

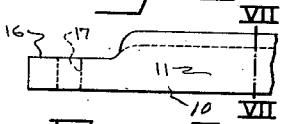


Fig. 6

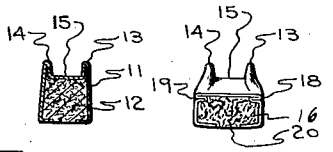


Fig. 7 Fig. 8

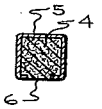


Fig. 5

Inventor

OTIS C. CURRIE

By Beaman & Langford

Attorneys

Patented Aug. 13, 1940 2,211,648

UNITED STATES PATENT OFFICE

2,211,648

CONVEYER ELEMENT

Otis C. Currie, Jackson, Mich., assignor to Reynolds Spring Company, Jackson, Mich., a corporation of Delaware

Application March 6, 1939, Serial No. 259,933

4 Claims. (Cl. 198—199)

This invention relates to conveyers and more particularly to the bars or slats arranged transversely and longitudinally spaced along flexible conveyer belts.

Bars or slats for flexible conveyer belts usually are constructed of wood because of the ease with which a flexible belt may be stapled or nailed to them. Wood constructions, however, are not satisfactory because of their inability to withstand wear and hard usage. Metal constructions have been tried but have been found unsatisfactory because of the difficulty required to attach the middle portions thereof to the flexible belting. The present invention has overcome the difficulties of the prior art by providing conveyer bars or slats of the type described, constructed of composite sheet metal and fibrous material strips, having exposed portions of fibrous material for the purpose of receiving driven fastening members, such as tacks, staples or the like. According to the present invention the composite strips employed are also flat at the end and provided with openings for receiving rivets or like fasteners for the purpose of attaching the bars or slats to the flexible belt more securely than by the intermediate driven fastening members.

An object of the present invention is to provide conveyer elements of the character described composed of composite sheet metal and fibrous material strips.

Another object of the invention is to provide conveyer elements of the character described composed of composite sheet metal and fibrous material strips, having exposed portions of fibrous material for the purpose of receiving the driven fastening means such a tacks, staples or the like.

A further object of the invention is to provide conveyer elements of the character described composed of composite sheet metal and fibrous material strips having openings at the ends, which preferably are flat, for receiving rivets or like fastening members.

A still further object of the invention is to provide conveyer elements of the character described of composite sheet metal and fibrous material strips of novel construction.

These and other objects will be apparent from the following specification when taken with the accompanying drawing, in which

Fig. 1 is a perspective view showing a portion of a conveyer belt having a conveyer element according to the present invention attached thereto,

Fig. 2 is a transverse vertical section through a conveyer belt having an element according to the present invention attached thereto,

Fig. 3 is a plan view of the construction disclosed in Fig. 1,

Figs. 4 and 5 are sections on the line IV—IV and V—V respectively, of Fig. 2,

Fig. 6 is a partial side elevation showing another form of conveyer element,

Fig. 7 is a section on the line VII—VII of Fig. 6, and

Fig. 8 is an end elevation of the construction shown in Fig. 6.

Referring particularly to the drawing the reference character 1 indicates a flexible conveyer belt of canvas or some other flexible material. Extending laterally across the belt 1 are a plurality of bars 2 (one only being shown in Fig. 1) secured at their end portions to the belt 1, by hollow rivets 3. It will be understood, of course, that other types of rivets or equivalent fastening means such as nuts and bolts may be employed. In practice the bars 2 are spaced longitudinally along the belt 1. Each bar 2 comprises a strip of composite sheet metal and fibrous material in the form of a fibrous core 4, completely surrounded by a sheet metal sheathing 5 except for a longitudinal space 6 on the underside of the strip 2, exposing the fibrous material core 4. It is preferred that the fibrous material comprising the core 4 be of fibre, compressed paper or the like and that the sheathing 5 be of some rollable metal such as suitable grades of sheet steel, aluminum alloy or the like. It is preferred that the sheathing 5 be rolled around the core 4, although this step is not a necessary part of the invention.

As shown particularly in Fig. 2 each bar 2 is secured to the belt 1 by staples 7 passing through the belt 1 and into the fibrous material core 4, through the slot 6. As shown particularly in Fig. 2 the staples 7 should be of such a length as they are clinched by engaging with the top surface of the bar 2. Such clinching is desirable because of the limited frictional grip against the staples 7 offered by the fibrous core 4. The particular advantage of the exposed fibrous material core 4 is that it permits the driving of fasteners such as the staples 7, nails or the like, greatly simplifying the work of attaching the intermediate portions of the bar 2 to the belt 1.

In order to more securely attach the bars 2 to the belt 1, the rivets 3 are passed through the belt 1 and the ends of the bars 2, as shown particularly in Figs. 2 and 3. In order to permit each bar 2 to offer a greater resistance to stress

in the plane of the belt 1 than would otherwise be offered, the ends of each bar 2 are flattened and drilled or punched to provide holes 8 for receiving the rivets 3. It will be evident that due to the construction of the bars 2 they may be readily flattened at their end portions by a simple application of pressure or by stamping, the sheet metal sheathing 5 and fibrous material core 4, being particularly adaptable to being deformed, without weakening. Thus the bar 2 may be originally formed in a continuous strip of uniform size having the dimensions of the portions of the bars 2 intermediate the ends thereof. Another advantage of the flattened ends of each bar 2 is the fact that the over-all height of the flat ends being less than that of the intermediate portion permits the use of a headed fastening means, such as the rivets 3 without the heads projecting past the plane of the top surface of the bar 2. This feature is particularly important in machines where the belt is endless in form, passing over two spaced rollers and the lower or inactive portion moves over a plate with which the top surfaces of the bars 2 slidably contact. Were not the heads of the rivets 3 recessed inwardly from the plane of the top surfaces of the bars 2, the heads would bear directly against said plate gouging the same and wearing down the heads of the rivets. With the recessed structure the weight of the entire belt assembly is uniformly distributed over the top surfaces of the bars 2.

In Figs. 6, 7 and 8 is disclosed another form that the conveyor bar or slat may take. In this form the bar 10 which corresponds to the bar 2 disclosed in Figs. 1, 2 and 5 consists of a sheet metal sheathing 11 and a core 12 of fibrous material corresponding to the core 4 of the bar 2, as shown particularly in Figs. 7 and 8. As in the case of the first form of the invention, the longitudinal edges of the sheathing 11 are spaced to expose the core 12. The bar 10 is provided with flanges 13 and 14 projecting upwardly from the top surface thereof. The flanges 13 and 14 serve not only to increase the over-all height of the bar 10, thereby increasing its vertical material engaging surface, but also provide a channeled top to the bar 11 which serves to provide a greater driving or moving force on straw or the like when such materials are being moved by the conveyer. Another important result of the provision of the flanges 13 and 14 is that they not only make possible a saving of the fibrous material 11, but also make the top surface 15 of the bar 10 available as a clinching plate for the staples 7. Practical considerations require that the staples 7 have a predetermined maximum length. Thus by providing flanges 13 the over-all height of the bar 10 may be anything desired while at the same time the top surface 15 thereof may be at a fixed distance from the lower side thereof, to provide a clinching plate for the staples 7.

As in the case of the bar 2, the bar 10 is flat at its ends 16 to provide adequate lateral resistance for hollow rivets disposed therethrough. Suitable holes 17 for rivets are provided. As shown particularly in Fig. 8, at the flat ends 16 of the bar 10, the vertically extending flanges 13 and 14 are deflected sideways and outwardly to form folds 18 and 19 respectively. In flattening the end portions 16, the sheathing 11 and the core 12 are formed into a solid mass with no projecting portions. At the same time the lower surfaces 20 of the end portions 16 are preferably provided with a radius as shown particularly in Fig. 8. The curved surface 20, thus provided, is of particular advantage in that when the same is riveted to a belt the curved surface 20 has the effect of reducing the wear or chafing of the bars or slats on the belt.

From the foregoing specification it will be apparent that in each form of the invention I have provided a new conveyer bar or slat which is not only simple and economical to make, but also one which is readily attachable to conveyer belt with a minimum expenditure of labor, while at the same time the sheet metal box construction provided by the sheathing provides a conveyor bar or slat of great strength and a light weight. It will be understood that while the sheathing has been disclosed as having spaced edges to provide a slot along the lower surface of each bar, the sheathing may be made to completely surround the fibrous material core, if suitable openings are provided in the underside of the sheathing to expose the fibrous material core so that driven fastening means, such as staples or the like, may be driven thereinto for the purpose of securing the belt to the bar.

Having thus described my invention what I desire to secure by Letters Patent and claim is:

1. In a flexible conveyer belt of the character described having a plurality of transverse bar members disposed in spaced relation along the same, a bar member comprising a strip of composite sheet metal and fibrous material, said strip having along one side thereof exposed portions of fibrous material for receiving driven fastening means, whereby the same may be secured to the belt by staples or the like, said bar having flat ends of greater width than the intermediate portion thereof, and having an opening through each flat end for receiving a rivet, or the like, for securing the same to the belt.

2. A conveyer element of the character described comprising a strip of fibrous material having a metal sheathing therearound, said sheathing having portions exposing portions of said fibrous strip to permit the same to receive driven fastening means, said element having flat ends, said ends being of greater width and lesser depth than the intermediate portion of said element and having openings therethrough for receiving rivets or the like.

3. A conveyer element of the character described comprising a strip of fibrous material having a metal sheathing directly therearound, said sheathing having portions exposing portions of said fibrous strip to permit the same to receive driven fastening means, for connecting the same to a belt, said element having side faces, each of said side faces having the sheathing covering the same projecting upwardly and reversely folded on itself to provide upwardly extending flanges providing a channel therebetween.

4. A conveyer element of the character described comprising a strip of fibrous material having a metal sheathing directly therearound, said sheathing having portions exposing portions of said fibrous strip to permit the same to receive driven fastening means, for connecting the same to a belt, said sheathing having a portion thereof extending upwardly from the top of said element and reversely bent upon itself to provide an upwardly projecting flange.

OTIS C. CURRIE.