April 2, 1946. H. AMBRUSON 2,397,584

CONVEYER BELT GUARD EDGE

Filed Feb. 1, 1943

Fig.1.

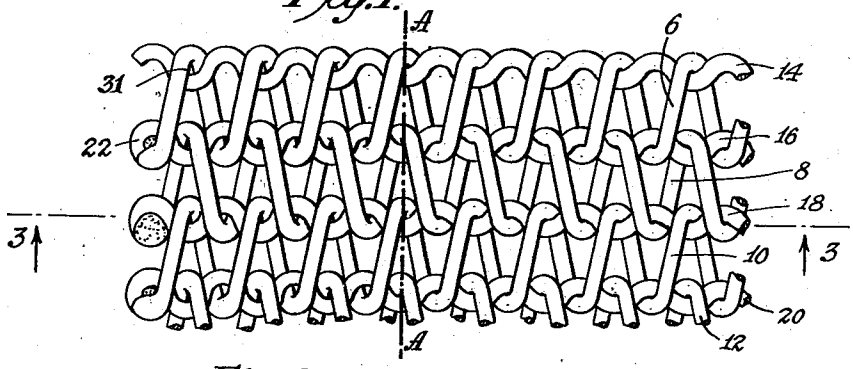

Fig.2.

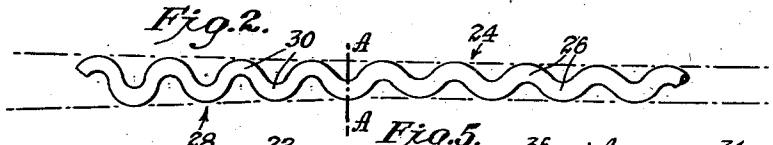

Fig.5.

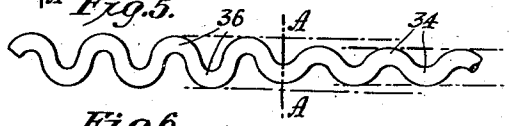

Fig.3.

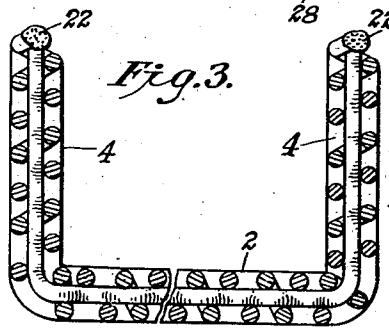

Fig.6.

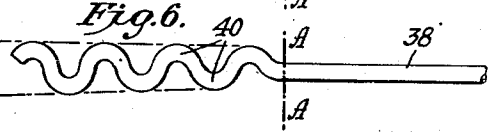

Fig.7.

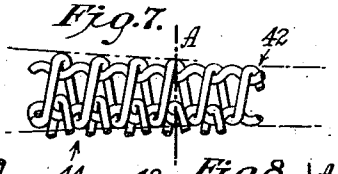

Fig.9.

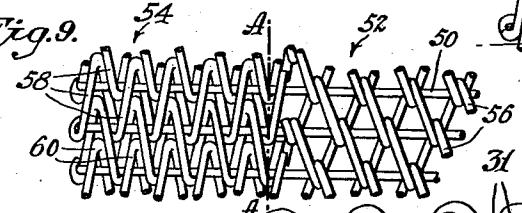

Fig.8.

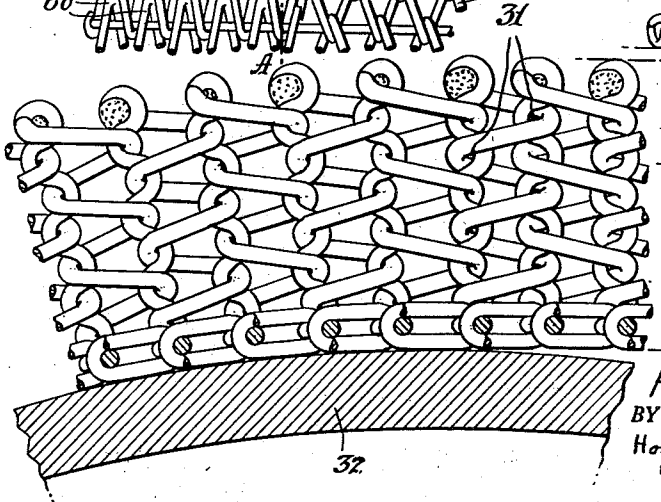

Fig.4.

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CONVEYER BELT GUARD EDGE

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Application February 1, 1943, Serial No. 474,268

13 Claims. (Cl. 198—201)

This invention relates to wire conveyers having one or more flanges thereon and particularly to constructions whereby the flange is capable of greater elongation than the remainder of the conveyer so that on passage of the conveyer about an arcuate surface the flange will not be distorted or impose undesirable strains upon the conveyer.

It has been recognized heretofore that when a flanged conveyer passes about an arcuate surface the arc through which the flange travels has a greater radius than the arc through which the body of the conveyer travels and that some provision should therefore be made to avoid the application of strains due to the tension on the periphery of the flange or the cramping of the central portion of the conveyer. In order to overcome this difficulty in flanged wire conveyers it has been suggested heretofore that certain of the wires in the flange be omitted to permit relative movement of the remaining wires in order that the flange may be elongated as the conveyer passes about an arcuate surface. However, if wires are omitted from the flange, the strength of the flange is reduced, and there is a tendency for the flange to bend outward when the conveyer is heavily loaded and material presses outward against the flange. Under these circumstances some of the material may fall from the conveyer.

In accordance with the present invention these objections to constructions of the prior art are overcome and means provided whereby the flange of the conveyer retains all of the strength of the central portion of the conveyer, but the wires forming the flange are capable of such relative movement as to permit elongation of the flange as the conveyer passes about an arcuate surface.

These advantages may be attained in various ways and by the use of numerous forms of interlaced wires. However, in general, constructions embodying the present invention include one or more transversely extending wires having end portions disposed in the flanges which permit greater relative movement of the wires in the flange than in the body of the conveyer. In the preferred forms of the invention shown in the drawing and hereinafter described, the end portions of the wires have undulations or convolutions therein which are larger than those of the central portion of the wires.

One of the objects of the present invention is to provide a wire conveyer with flanges possessing the desired strength but capable of elongation to avoid the application of strains to the flange or conveyer when the conveyer passes about an arcuate surface.

Another object of the invention is to provide a wire conveyer with a flange and having transversely extending wires provided with end portions disposed in the flange and formed to permit greater relative movement of the wires in the flange than in the body of the conveyer.

A further object of the invention is to provide a flanged wire conveyer with transversely extending wires having end portions thereof disposed in the flange, the convolutions in the end portions of the wires being deeper or larger than those in the portions of the wires located in the body of the conveyer.

These and other objects and features of the invention will appear from the following description thereof in which reference is made to the figures of the accompanying drawing.

In the drawing:

Fig. 1 is a plan view of a portion of a conveyer with the flange forming portion thereof turned outward to show the difference in construction of the body and flange.

Fig. 2 is a plan view of one of the connecting wires embodied in the construction of Fig. 1.

Fig. 3 is a vertical sectional view of the finished conveyer showing the relation of the flanges to the body of the conveyer in the finished construction.

Fig. 4 is a vertical sectional view of the conveyer and a pulley about which it passes.

Fig. 5 is a plan view of a portion of an alternative form of connecting wire embodying the present invention.

Fig. 6 is a plan view of a portion of a further alternative form of connecting wire embodying the present invention.

Fig. 7 is a plan view of a portion of an alternative form of coil adapted for use in conveyers, embodying the present invention.

Fig. 8 is a plan view of a portion of a further alternative form of coil adapted for use in conveyers embodying the present invention, and

Figure 9 is a plan view of a portion of another embodiment of the invention.

In that form of the invention shown in Figs. 1 to 4 of the drawing, the conveyer has a central portion or body 2 formed of wires interlaced and arranged as desired, and is provided with flanges 4 extending along one or both edges of the central portion of the conveyer. The particular style of weave or the arrangement of the wires and the manner in which they are interlaced in forming

the belt is capable of wide variation, but for purposes of simplicity in illustrating the invention, the conveyer is shown as formed of a plurality of transversely extending coils 6, 8, 10 and 12, the convolutions of which are hingedly connected by means of transversely extending connecting wires 14, 16, 18 and 20. The coiled wires 6, 8, 10 and 12 are uniform throughout the length thereof and extend to the central portion of the conveyer, shown at the right of the dotted line A—A in Fig. 1 to the edge 22 of the flange forming portion 4 of the conveyer shown at the left of line A—A in Fig. 1. While the coils 6, 8, 10 and 12 are similar, the coils 6 and 10 are "right hand" coils, whereas the coils 8 and 12 are "left hand" coils, as is usual in wire conveyer construction.

The connecting wires 14, 16, 18 and 20 which hingedly connect the coils have central portions 24, on the right of the line A—A in Fig. 1, that are provided with undulations or convolutions 26 of one size, and end portions 28 in the flange forming portion of the conveyer, located on the left of the line A—A, which have deeper but uniformly spaced undulations or convolutions 30. The end portions of the connecting wires and the end portions of the coils are thus disposed at the edges of the conveyer and after forming the conveyer, the edges are turned upward to form the flanges 4 at the opposite edges of the central portion 2 of the conveyer.

The undulations or convolutions 26 and 30 in the connecting wires may lie in a single plane or they may, if preferred, be arranged in the form of a spiral or helix. For this reason such undulations in the connecting wires 14, 16, 18 and 20 and the turns in the coils 6, 8, 10 and 12 are all referred to hereafter in the specification and claims as "convolutions" in the respective wires.

When tension is applied to the conveyer the uniform convolutions in the central portion of the coils 6, 8, 10 and 12 are drawn into direct contact with the uniform convolutions 26 in the central portion of the connecting wires 14, 16, 18 and 20. However, the convolutions of the coils located in the flanges of the conveyer are not drawn into direct contact with the larger convolutions 30 of the end portions of the connecting wires in the flanges 4. The portions of the coils and connecting wires located in the flanges are therefore spaced as shown at 31 in Figs. 1 and 4 and are capable of relative movement to permit elongation of the flange as the conveyer passes about an arcuate surface, such as the pulley 32 shown in Figure 4.

The convolutions 30 in the end portion 28 of the connecting wires shown in Figs. 1 and 2 are of progressively increasing size or depth toward the extremities of the wires and the edges 22 of the flanges but are spaced as in the central portion 24 of the wire. The portions of the coils located adjacent the edges of the flanges therefore are capable of greater relative movement than those portions located near the central portion or body 2 of the conveyer to permit the conveyer to pass about a pulley or other arcuate surface of relatively small diameter while providing substantially uniform support therefor. As the limit of flexing is approached, all of the convolutions of the coils in the flanges move together into complete engagement with convolutions of the connecting wires and no one portion of the flange will be subjected to a greater or materially different strain than another.

In the alternative construction shown in Fig. 5 the portion of the connecting wire which is located in the central portion of the conveyer has uniform relatively small convolutions 34, while the portions of the wire disposed in the flange is formed with uniformly deeper convolutions 36 spaced the same distance apart as the convolutions 34.

The construction of Fig. 6 is similar to that of Fig. 2, but the central portion 38 of the connecting wire is perfectly straight or has convolutions of negligible size therein, whereas the end portions 40 of the wire are formed with convolutions of progressively increasing size toward the extremities thereof.

It will be apparent that either of the forms of connecting wire shown in Figs. 5 and 6 may be used in place of the connecting wire of Fig. 2 to produce a flanged wire conveyer in which the wires in the flanges are capable of sufficient relative movement to permit elongation of the flange as the conveyer passes over an arcuate surface or over a pulley.

In the further alternative forms of the invention shown in Figs. 7 and 8 the coils themselves are non-uniform in construction in that the portions of the coils designed to be located in the body or central portion of the conveyer have convolutions of one diameter, whereas the end portions of the coils are provided with convolutions of larger diameter. These coils may be used in combination with conventional connecting wires which are either straight or formed with uniform convolutions throughout the length thereof. However, if desired, the coils of Figs. 7 and 8 may be used with the connecting wires of Figs. 2, 5 or 6 to provide for still further relative movement of the wires which make up the flanges of the conveyer and to enable the conveyer to be passed about a pulley of very small diameter.

In the form of coil shown in Fig. 7 the central portion 42 thereof is provided with convolutions of uniform size, while the convolutions in the end portions 44 of the coils are of progressively increasing size toward the extremities of the coil. In Fig. 8 the central portion 46 of the coil has convolutions of uniform size, whereas the convolutions 48 in the end portions of the coil are of uniform size, but are larger than the convolutions 44.

In that form of the invention shown in Fig. 9 of the drawing the connecting wires 50 are straight and extend through the central portion 52 of the conveyer to the edges of the marginal portion 54 which ultimately forms the flange of the conveyer. The coils of wire 56 embodied in the central portion of the conveyer have convolutions of one size interlaced with corresponding convolutions of adjacent coils and have the straight wires 50 passing through the interlaced coils. Separately formed coils of wire 58 having larger convolutions hingedly connected by the straight wires 50 form the marginal portion or flange of the conveyer. The ends of the wires 56 are welded to the larger coils 58 along the line A—A before turning up the edge to form the flange. The flange is thus connected to the central portion of the conveyer adjacent the outer ends of the wires 56 and adjacent the inner ends of the wires 58.

With this construction the connecting wires 50 are located adjacent the apices of the coils of the wires forming the central portion 52 of the conveyer but are spaced at 60 from the apices of the coils in the flange forming marginal portion 54. The wires in the flange are thus capable of movement to permit elongation of the flange

as the conveyer passes about a curved surface while the wires in the central portion of the conveyer are permitted to undergo hinge movement about the wires 50 but are held against relative movement longitudinally of the conveyer.

Generally, the conveyer is formed as a continuous flat construction as shown in Fig. 1 and thereafter the marginal flanges are formed by turning the edges thereof upward along the line A—A to provide the finished flanged conveyer. It is preferable to weld the connecting wires to the coils along line A—A to securely bond the wires together at the opposite edges of the conveyer body and at the points at the base of the flanges about which the wires are bent to form the flanges.

While certain preferred forms of wire conveyers embodying the present invention have been shown in the drawing and described above, it will be apparent that the type of weave or arrangement and relative positions of the wires in the conveyer and the shape and form of the connecting wires and coils employed are capable of many changes and modifications without departing from the spirit and scope of the invention. It should, therefore, be understood that the particular embodiments thereof specifically referred to and shown in the drawing are intended to be illustrative of the invention and are not intended to limit the following claims.

I claim:

1. In a wire conveyer having flanges adjacent the opposite edges thereof and embodying coils of wire hingedly connected by transversely extending connecting wires, said connecting wires having opposite end portions disposed in said flanges and formed with convolutions of larger size in said opposite end portions which permit greater relative movement of the coils of wire in the flanges than in the central portions of the conveyer, whereby movement of the conveyer about an arcuate surface will permit greater elongation of the flanges than of the central portion of the conveyer.

2. In a wire conveyer having flanges adjacent the opposite edges thereof and embodying coils of wire hingedly connected by transversely extending connecting wires, said connecting wires having opposite end portions disposed in said flanges and formed with convolutions of progressively increasing size toward the extremities thereof to permit greater relative movement of the coils of wire in the flanges than in the central portion of the conveyer.

3. In a wire conveyer having flanges adjacent the opposite edges thereof and embodying coils of wire hingedly connected by transversely extending connecting wires, said connecting wires having opposite end portions disposed in said flanges and formed with convolutions of uniformly greater size than the central portion of the wire to permit greater relative movement of the coils of wire in the flanges than in the central portion of the conveyer.

4. A wire conveyer having flanges adjacent the opposite edges thereof and embodying coils of wire hingedly connected by transversely extending connecting wires, the central portion of the connecting wires in the conveyer having convolutions therein of one size and the portions of the connecting wires located in the flanges of the conveyer having convolutions therein of a larger size.

5. A wire conveyer having flanges adjacent the opposite edges thereof and embodying coils of wire hingedly connected by transversely extending connecting wires, the central portion of the connecting wires in the conveyer having convolutions therein of one size and the portions of the connecting wires located in the flanges of the conveyer having convolutions therein increasing progressively in size from the central portion of the conveyer toward the edges of the flanges.

6. In a wire conveyer having flanges at the opposite edges thereof and embodying coils of wire hingedly connected by transversely extending connecting wires, said connecting wires having opposite end portions disposed in said flanges, said connecting wire having convolutions throughout the length thereof, the convolutions in that portion of the connecting wire located in said flanges being larger than the convolutions adjacent the center of the wire whereby the flanges of the conveyer are capable of greater elongation than the center of the conveyer.

7. In a wire conveyer having flanges adjacent the opposite edges thereof and embodying coils of wire hingedly connected by transversely extending connecting wires, said connecting wires having opposite end portions disposed in said flanges, and formed with uniform convolutions adjacent the central portion thereof and convolutions of larger size in that portion of the connecting wires located in the flanges to permit greater relative movement of the wires in the flanges than in the central portion of the conveyer.

8. In a wire conveyer having flanges adjacent the opposite edges thereof and embodying coils of wire hingedly connected by transversely extending connecting wires, said connecting wires having opposite end portions disposed in said flanges and formed with uniform convolutions adjacent the central portion of the connecting wires and convolutions of progressively increasing size in that portion thereof located in the flanges of the conveyer to permit greater relative movement of the wires in the flanges than in the central portion of the conveyer.

9. A wire conveyer having a central portion and having flanges adjacent the opposite edges thereof, said conveyer comprising coils of wire extending transversely of the conveyer and provided with end portions disposed in said flanges, and connecting wires extending across the conveyer and hingedly connecting said coils of wire, said connecting wires having end portions disposed in said flanges and formed with convolutions therein of such size as to permit greater elongation of the flanges than of the central portion of the conveyer as the conveyer passes about an arcuate surface.

10. A wire conveyer having a central portion and having flanges adjacent the opposite edges of the central portion, said conveyer comprising coils of wire extending transversely of the conveyer and provided with opposite end portions disposed in said flanges, and connecting wires extending transversely across the conveyer and hingedly connecting said coils, said connecting wires having portions located in the central portion of the conveyer and provided with uniform convolutions of one size and having end portions located in said flanges and provided with convolutions of larger size therein to permit greater relative movement of the wires in the flanges than in the central portion of the conveyer whereby movement of the conveyer about an arcuate surface will permit greater elongation of the flanges than of the central portion of the conveyer.

11. A wire conveyer having a central portion and having flanges adjacent the opposite edges of the central portion, said conveyer comprising coils of wire extending transversely of the conveyer and provided with opposite end portions disposed in said flanges and connecting wires extending transversely across the conveyer and hingedly connecting said coils, said connecting wires having portions located in the central portion of the conveyer and provided with convolutions therein and having end portions located in said flanges and provided with convolutions progressively increasing in size from the central portion of the conveyer to the edges of said flanges to permit greater relative movement of the wires in the flanges than in the central portion of the conveyer whereby movement of the conveyer about an arcuate surface will permit greater elongation of the flanges than of the central portion of the conveyer.

12. In a wire conveyer having a bottom and a flange adjacent one edge thereof and embodying transversely extending continuous coils of wire and transversely extending continuous connecting wires hingedly connecting said coils of wire, each of said coils and connecting wires extending through said bottom and flange and having its axis located in a single plane extending transversely of the conveyer, said coils of wire and connecting wires constituting said bottom and flange, and one of the groups consisting of the group of coils of wires and the group of connecting wires comprising convolutions each of which is of uniform transverse interior diameter throughout along the length of the conveyer and of greater diameter in the direction of the length of the conveyer in the portions located in the flange than in the portions located in the bottom of the conveyer to permit elongation of the flange as the bottom of the conveyer passes over an arcuate surface.

13. A wire conveyer having a central portion and having flanges adjacent the opposite edges thereof, said conveyer comprising continuous coils of wire each extending transversely of said central portion and each having end portions disposed in said flanges, each of said coils having its axis located in a single plane extending transversely of the conveyer, and each of the convolutions of said coils being of uniform transverse interior diameter throughout along the length of said conveyer, and connecting wires extending transversely of said central portion and having end portions disposed in said flanges and hingedly connecting said coils in said central portion and flanges, the end portions of said coils having convolutions of progressively increasing diameters toward the extremities thereof in the direction of the length of said conveyer to permit elongation of the flanges of the conveyer as the central portion of the conveyer passes about an arcuate surface.

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