July 9, 1935. A. O. HURXTHAL 2,007,862

SCREEN CONVEYER

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Fig. 1.

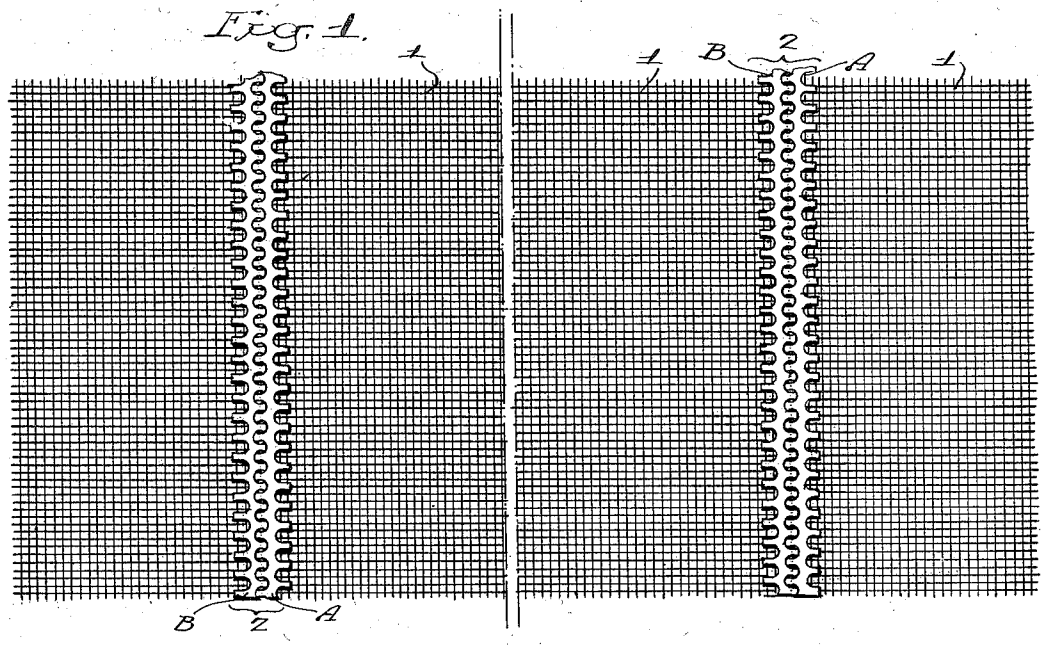

Fig. 2.

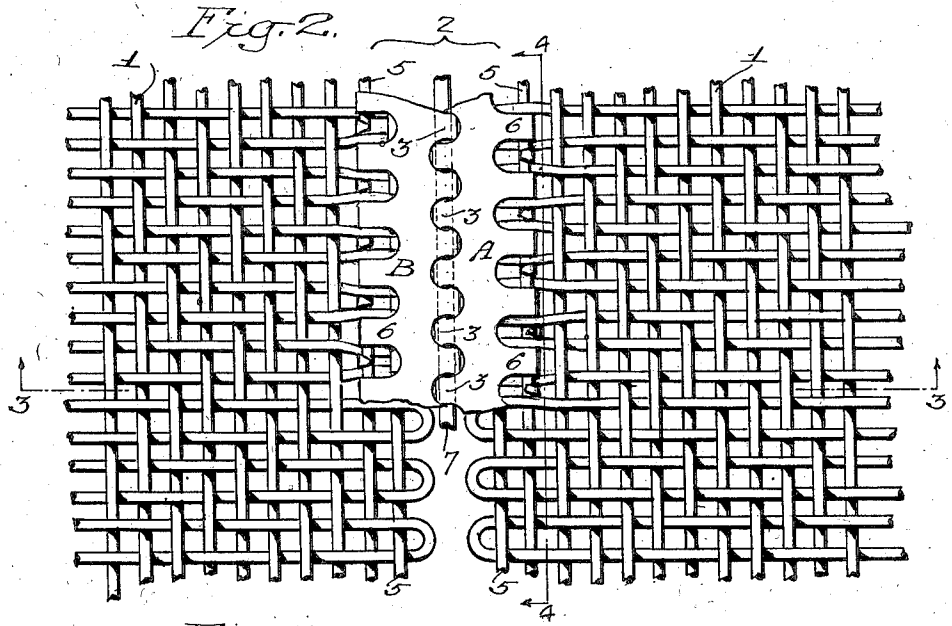

Fig. 3.



Fig. 4

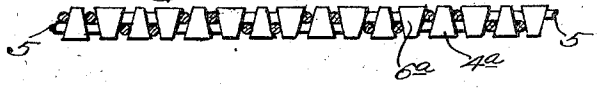

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Fig. 5

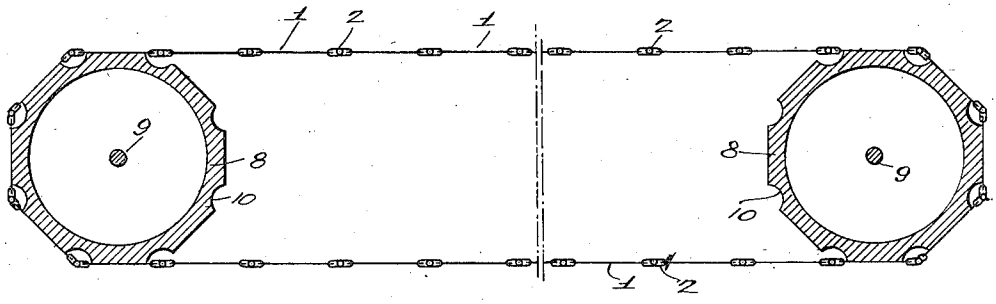

Fig. 6

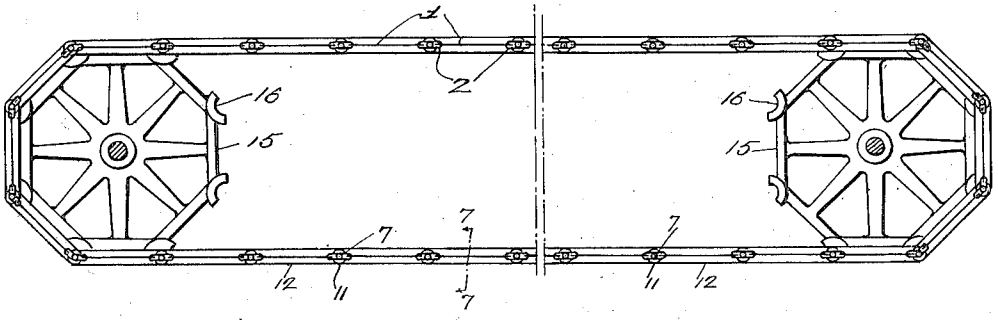

Fig. 7

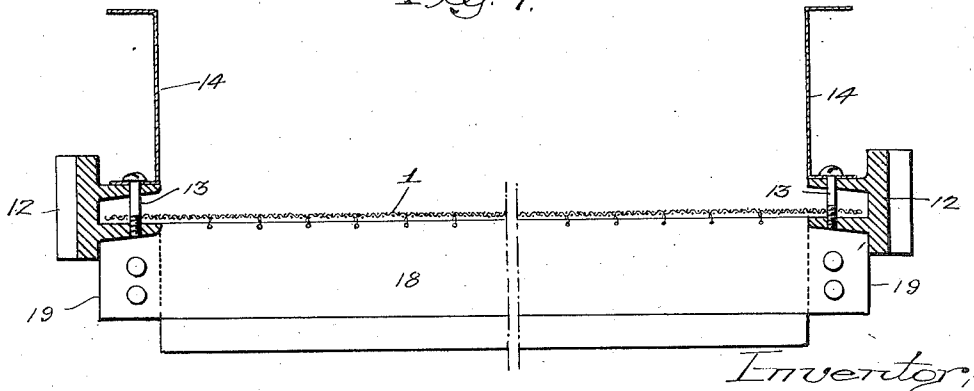

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Fig. 9.

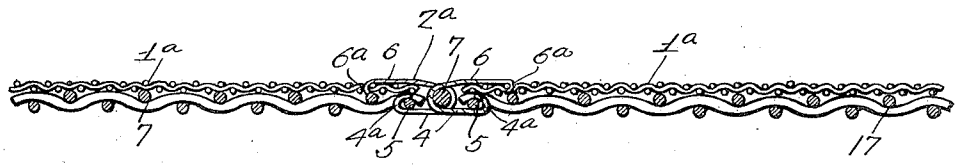
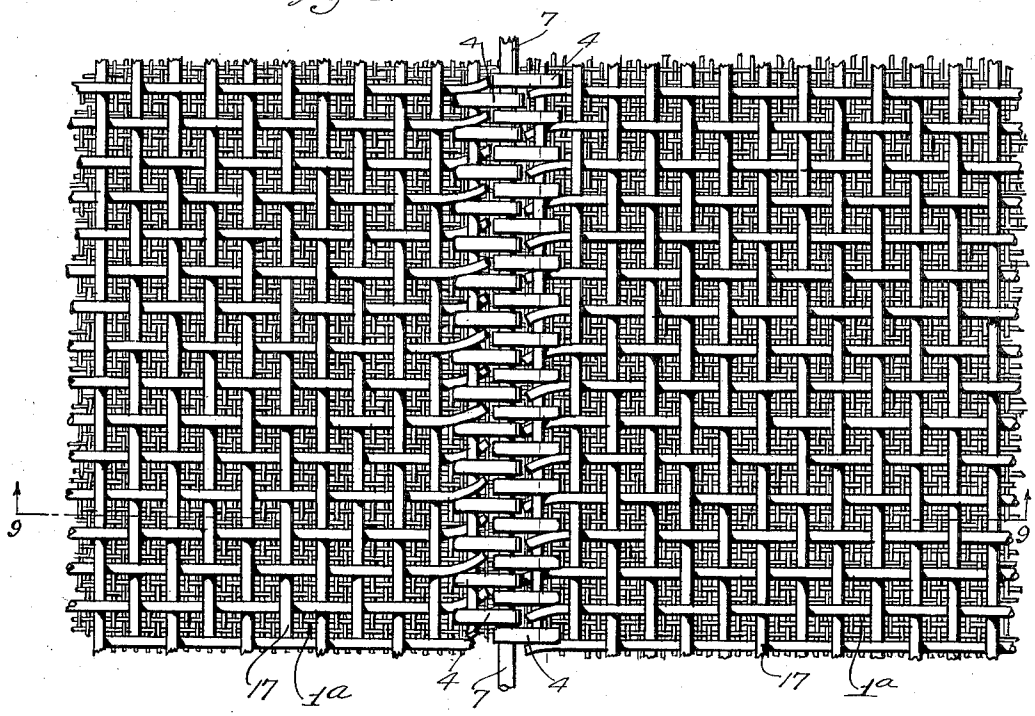


Fig. 8.



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Patented July 9, 1935 2,007,862

UNITED STATES PATENT OFFICE

2,007,862

SCREEN CONVEYER

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Application December 22, 1933, Serial No. 703,621

6 Claims. (Cl. 198—194)

This invention relates to new and useful improvements in screen conveyers and more particularly to relatively fine mesh screen conveyers of the endless sectional type.

The principal object of the invention is to provide a conveyer of the character set forth having means for pivotally connecting successive sections or the ends of a conveyer apron whereby flexing of the screen mesh during passage about the customary supporting pulleys or drums is eliminated.

Another object of the invention is to provide a conveyer of the stated character wherein the means for pivotally connecting sections or ends of the conveyer apron is arranged to occupy but a relative small proportion of the surface area of the conveyer section or apron so as not to detract from the operativeness thereof.

Another object of the invention is to provide a screen conveyer of the character set forth which may be readily adapted to both the plain apron and link or chain type of conveyer.

Another object of the invention is to provide a sectional screen mesh conveyer of the character set forth wherein the section couplings are designed so that any section can be readily detached and replaced.

A further object of the invention is to provide a screen conveyer for comparatively heavy work comprising relatively superimposed layers of fine and more coarse screen mesh sections the adjacent ends of which are pivotally connected by novel means which function also to secure the said screen mesh layers to each other.

Certain other objects and the details of construction of the invention are set forth hereinafter and shown in the accompanying drawings, in which:

Fig. 1 is a view in plan of a fine mesh screen conveyer made in accordance with the present invention.

Fig. 2 is an enlarged fragmentary view in plan of a portion of the apron and pivoted joint shown in Fig. 1.

Fig. 3 is a view in section on line 3—3, Fig. 2.

Fig. 4 is a view in section on line 4—4, Fig. 2.

Fig. 5 is a view in elevation of an apron type of conveyer embodying the present invention.

Fig. 6 is a view similar to Fig. 5 showing the invention embodied in a chain or link conveyer.

Fig. 7 is an enlarged transverse view in section on line 7—7, Fig. 6, and showing in addition the customary side walls associated therewith.

Fig. 8 is an inverted plan view of a modified form of conveyer within the contemplation of the invention; and

Fig. 9 is a view in section on line 9—9, Fig. 8.

Heretofore, considerable difficulty has been encountered in the use of continuous conveyers having screen aprons of relatively fine mesh because of the necessity for said aprons to flex as the same pass about the customary supporting pulleys and drums. This flexing of the screen apron causes the longitudinal strands of wire therein to bend in alternately opposite directions thus weakening them and causing ultimate severing thereof on a line transversely of the conveyer; and while comparatively open mesh screen conveyer apron sections may be pivotally connected in the manner shown and described in United States Patent No. 1,634,963 issued on July 5, 1927 to Walter M. Schwartz this method is not practically adaptable to screening of relatively fine mesh and it is not possible to make such a joint in the latter as is shown in the above-mentioned patent.

The present invention contemplates the provision of a continuous conveyer apron comprising a number of relatively short sections of fine mesh screening successively connected together by means of a hinged joint in such a manner that will preclude flexing of the longitudinal strands of wire of the mesh screening as it passes about the supporting pulleys and accordingly eliminates any tendency for them to break.

Referring now particularly to the drawings, reference numeral 1 designates a screen conveyer apron section of relatively fine mesh, as for instance between 14 to 30 meshes per inch, the said sections 1 may be of any desired predetermined dimensions, and these should be determined according to the particular construction of the supporting pulleys therefor, as is described in detail hereinafter.

One element A of a hinged member designated generally as 2 is secured to one end of each of the screen sections 1 and the other or complementary element B is secured to the other end thereof. Each of the hinge elements A and B are substantially of the same construction and are provided with a plurality of spaced loops 3 which project laterally from the outer edge thereof in axial alignment with respect to each other. Integral portions 4 extend rearwardly from the under side of the spaced loops 3 and pass upwardly and over the second transverse strand 5 of the mesh screen section 1, as at 4a at the upper side of each of the hinge elements A and B, and alternately spaced with respect to the projections 4, a number of projections 6 extend in the direction of the screen section 1 and pass downwardly and under the second transverse strand 5 of said sec-

tions as at 6a. The elements A and B of the hinged member 2 are secured transversely of the ends of each of the screen sections 1 so that the spaced loops 3 at the outer edges thereof will cooperate as shown in Fig. 2 of the drawings to the extent that the loops 3 of each thereof are substantially co-axial with respect to each other. A rod or pin 7 extends through the loops 3 as shown and constitutes a common pivot point for the adjacent elements of the hinge 2 and screen sections of the apron.

It will be noticed by referring to the drawings that the proportionate surface area of the hinged member 2 with respect to the surface area of the adjacent screen sections 1 is sufficiently small as to not interfere with the efficient functioning of the screen mesh in its intended manner.

The conveyer construction shown in Figs. 1 and 2 may be adapted to continuous conveyers of both the apron and link or chain type such as disclosed in Figs. 5 and 6. In the former the apron comprises a predetermined number of successive sections 1 connected by means of the previously described members 2. The apron is mounted upon rotatable drums or pulleys 8 having shafts 9 and these drums or pulleys are provided at their circumference with axially parallel recesses or grooves 10 at equally spaced intervals thereabout arranged for engagement by the successive hinged members 2 as shown.

A fine mesh screen apron constructed as shown in Figs. 1 and 2 may be effectively used in a link or chain type conveyer as shown in Figs. 6 and 7, and in this form it is necessary that the pivot pin 7 connecting the successive sections 1 should be co-axial with the centers of the rollers 11 and the pivot points of the respective chain links 12. In this particular arrangement the screen sections 1 may be secured at their sides in grooves extending longitudinally of the links 12 of the chain by means of screws 13 which also serve to secure side walls 14 thereto so that articles may be piled to a substantial depth upon the apron.

In the present instance the chain conveyer is arranged to pass about sprockets 15 constructed similarly to the pulleys or drums 8 in Fig. 5 in that they are provided with recesses 16 spaced at equal intervals around the periphery thereof to receive the successive rollers 11 and/or pivot points of the chain links 12.

For the most efficient operation of a conveyer of the present type it is desirable that the recesses or grooves 10 and 16 in either form of pulleys 8 and 15 be circumferentially spaced one from the other a distance equal to the longitudinal dimensions of the screen sections 1 and that the surface of the drums intermediate the said recesses be disposed in a plane tangent to the center thereof so that the screen section 1 intermediate adjacent hinge members 2 may be supported in a common plane during traverse of the conveyer about the drums or pulleys. In this manner all relative angular movement in the conveyer will occur about the connecting pins 7, and preclude any possible severing of the strands of the mesh of the sections 1.

Of course, the specific arrangement of the pulleys 8 and sprockets 15 may be varied from the substantially octagonal shape shown in each of Figs. 5 and 6, and, for example, pulleys of hexagonal, pentagonal, or polygons having any number of sides may be provided, but it is essential and necessary to the efficient operation of the invention that the tangential dimension between any two adjacent recesses at the circumference of the pulleys be substantially equal to the distance between the successive pivot pins 7.

It will be obvious that in certain installations where the use of fine mesh screening in conveyer aprons is desirable the fine mesh wire may not be sufficiently strong to support the load to be carried thereby. Accordingly, it is within the contemplation of the present invention to provide a conveyer apron comprised in sections 1 constructed in the manner shown in Figs. 8 and 9 of the drawings wherein the fine mesh screening is backed or supported by a screen section of coarser open mesh 17. In this modification the sections of both the fine and more coarse supporting mesh are of the same dimensions and pivotally connected to an adjacent similar section by means of a hinged member 2a in substantially the same manner as previously set forth, the said hinged member functioning both to pivotally connect the adjacent sections 1a as well as secure together the superimposed layers of fine and open mesh 1a and 17 respectively comprising the same. The operating characteristics of the disclosures in Figs. 8 and 9 are similar to those set forth with regard to the disclosures in the other figures of the drawings and should be similarly mounted or supported by appropriately constructed pulleys or drums 8, and sprockets 15, depending whether the double layer apron is embodied in a plain apron or link or chain type of conveyer.

In the chain or link type of conveyer such as shown in Figs. 6 and 7 of the drawings it is desirable that girts 18 be provided intermediate the side chain links 12 as shown in Fig. 7 for the purpose of maintaining the said side chains properly spaced and affording a transverse support for the mesh apron 1. In the present instance the links of the side chains 12 are provided with depending brackets 19 to which the girts 18 are permanently secured, and the construction and mounting thereof is substantially similar to the girts disclosed in the previously mentioned United States Letters Patent No. 1,634,963 issued on July 5, 1927 to Walter M. Schwartz, although the same may or may not be mounted in mis-alignment with the pivotal joint of a particular conveyer as desired.

While specific details of one form of the invention have been disclosed for the purpose of description, it is not intended that the invention be entirely limited thereto except such as is not within the scope of the annexed claims.

What I claim is:

1. The combination in a mesh screen conveyer of a series of screen sections at least eight mesh per inch fine, a hinge element arranged for attachment to the ends of each of said sections, axially aligned loops at the outer edge of each of said hinge elements, said loops being arranged for coaxial association with the loops of another hinge member, means extending horizontally from each of said loops at the top and bottom of each hinge member and engaging at least one transverse strand in the screen section adjacent the end thereof, said means being of greater width than the mesh in said sections, and common means extending through the loops of each of said hinge elements to pivotally connect the same.

2. The combination in a mesh screen conveyer of a series of screen sections each comprised of relatively superimposed layers of fine and more coarse mesh, the former being at least eight mesh per inch fine, a separate hinge element arranged for attachment to the ends of each of said

sections, axially aligned loops at the outer edge of the hinge members, said loops being arranged for co-axial association with the loops of a hinge element of an adjacent section, means extending horizontally from said loops at the top and bottom of each of said hinge members and engaging at least one transverse strand in the screen sections adjacent the end thereof, and common means extending through the loops of each of said hinge members to pivotally connect the same.

3. The combination in a mesh screen conveyer having side carrying chains comprising a series of pivotally connected links, screen sections at least eight mesh per inch fine carried thereby and secured at their sides to said links, a hinge element arranged for attachment to the ends of each of said sections, axially aligned loops at the outer edge of each of said elements, said loops being arranged for co-axial association with the loops of a hinge member of an adjacent section, means extending horizontally from said loops at the top and bottom of each of said hinge members and engaging at least one transverse strand in the screen section adjacent the end thereof, said means being of greater width than the mesh of said sections, and pins extending through the loops of each of said elements to pivotally connect the same, said pins being in alignment with the pivots of the links but independent thereof.

4. The combination in a mesh screen conveyer having side carrying chains comprising a series of pivotally connected links, of a series of screen sections carried thereby, each comprised of relatively superimposed layers of fine and more coarse mesh, the former being at least eight mesh per inch fine, a separate hinge element arranged for attachment to the ends of each of said sections, axially aligned loops at the outer edge of the hinge members, said loops being arranged for co-axial association with the loops of a hinge element of an adjacent section, means extending horizontally from said loops at the top and bottom of each of said hinge members and engaging at least one transverse strand in the screen sections adjacent the end thereof, and common means extending through the loops of each of said hinge members to pivotally connect the same, said means being in alignment with the pivots of the links but independent thereof.

5. The combination in a mesh screen conveyer of a series of screen sections, each comprised of relatively superimposed layers of fine and more coarse mesh, the former being at least eight mesh per inch fine, a separate hinge element at each end of said sections, means on said elements engaging a transverse wire on each of said layers to secure the same together, and common means engaging portions of each of said hinge elements for pivotally connecting the same.

6. The combination in a mesh screen conveyer of a series of screen sections, a hinge element attached to the ends of each section, axially aligned loops at the outer edge of each hinge element, said loops being spaced to receive the loops of an adjacent section therebetween in aligned relation, means extending from the loop section over the upper and lower surfaces of the screen and engaging a transverse strand in the screen adjacent its ends, and means passing through the aligned loops of each hinge member to pivotally connect the same.

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