July 1, 1930. J. C. ANDERSON 1,769,818

ENDLESS CONVEYER

Filed Feb. 16, 1927

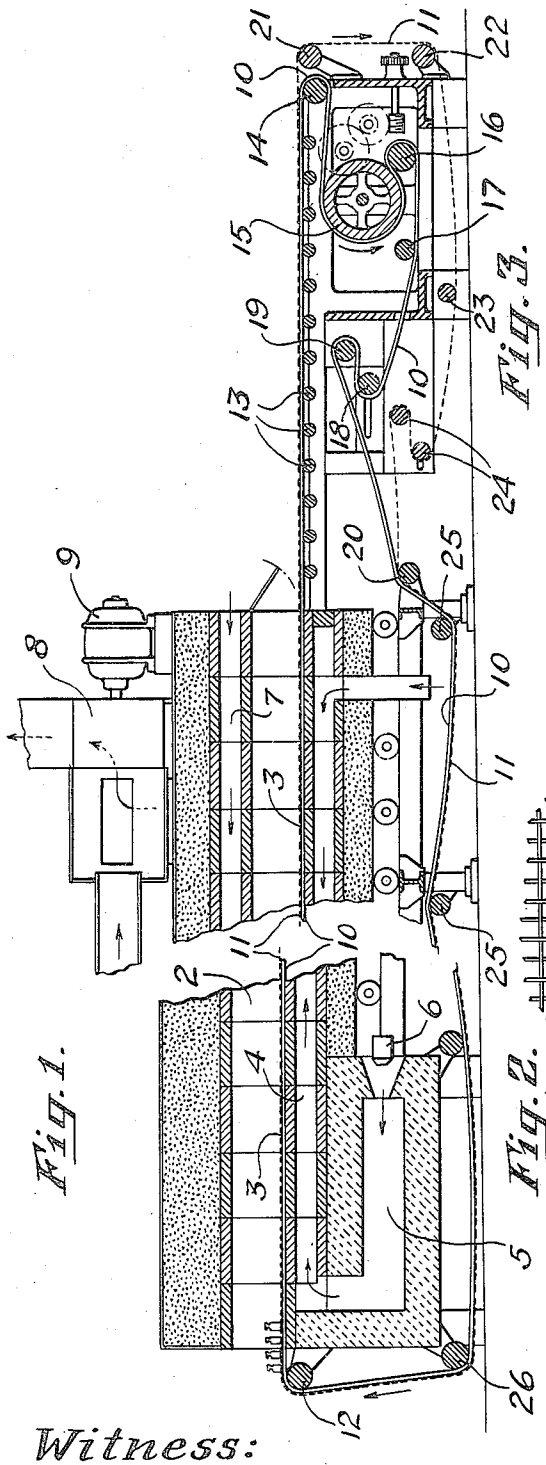


Fig. 1.

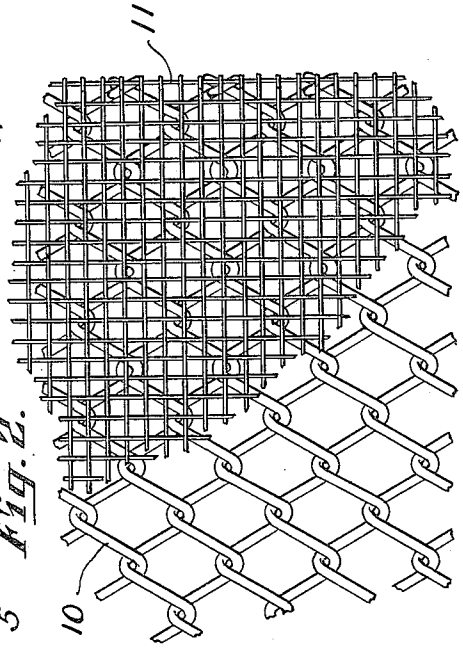


Fig. 2.

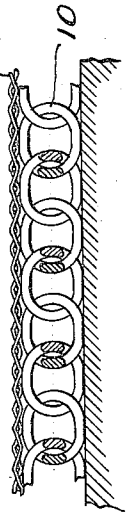


Fig. 3.

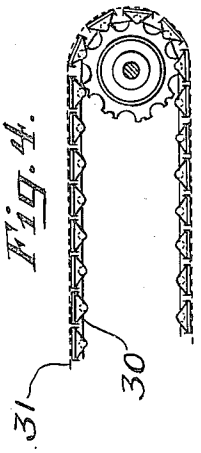


Fig. 4.

Witness:
A. A. Horn

Inventor
John C. Anderson
by Robert S. Brown
Attorney.

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UNITED STATES PATENT OFFICE

JOHN C. ANDERSON, OF KEYPORT, NEW JERSEY

ENDLESS CONVEYER

Application filed February 16, 1927. Serial No. 168,579.

My invention relates to endless conveyers and it has special reference to conveyers for transporting articles of glassware through annealing lehrs.

The object of my invention is to provide an improved endless conveyer having its load-bearing strand composed of two superposed conveyer members, the lower or primary conveyer being of such construction and arrangement as to support the load and to take the strain of pulling the load through the lehr, and the upper or secondary conveyer being so constructed as to support the load evenly.

Lehrs for annealing glassware are commonly provided with endless conveyers for transporting the glassware through the lehr. It was formerly customary to construct such conveyers of metal slats supported near their ends upon endless chains. More recently, flexible woven wire conveyers of low heat-capacity have been employed for this purpose as described, for example, in the U. S. Ingle Patent No. 1,583,046. Such woven wire conveyers have necessarily been made of sufficiently heavy wire to withstand the strain of pulling a heavy load of glassware through the lehr. It has been found that very small bottles are likely to tip over when placed in certain positions upon such woven wire conveyers.

According to my present invention, I provide a primary conveyer which may be of the old-style slat type, but is preferably of the woven-wire type. Resting upon this primary conveyer is a ware-supporting secondary conveyer which may be made from any flexible material capable of passing around rollers and having a sufficiently smooth surface to support small bottles or other articles, without danger of tipping over. The secondary conveyer may be made of finely woven spiral wire mesh or of square woven wire, like window screening, or may be of any other suitable construction. Preferably it should be sufficiently open in mesh to permit the passage of air and should be sufficiently light in weight to adapt itself to the changing temperature conditions within the lehr, without materially interfering with the temperature of the glassware.

In the accompanying drawing:

Figure 1 is a partial longitudinal sectional view showing the essential parts of an annealing lehr equipped with a conveyer constructed in accordance with my invention;

Fig. 2 is an enlarged fragmentary plan view showing portions of the two superposed conveyers;

Fig. 3 is an enlarged sectional view through portions of the superposed conveyers; and

Fig. 4 is a fragmentary longitudinal sectional view showing a modified construction in which the primary conveyer is of the old-style slat type.

The lehr shown in Fig. 1 of the drawing is of the general construction described in the Ingle patent mentioned above and in the Mulholland Patent No. 1,560,481. It comprises a tunnel 2 having a flat metal floor 3 beneath which are flues 4 into which hot gases are introduced from a fire box 5 into which flames from a burner 6 are directed. The lehr is preferably provided with cooling flues 7 above the lehr tunnel and with a suction fan 8 driven by a motor 9 for drawing air through the cooling flues 7 and for drawing combustion products and air through the hot flues 4. Dampers and other arrangements for controlling the temperature within the tunnel 2 are also preferably provided, but arrangements are omitted from the drawing since they form no part of my present invention.

Glassware is transported through the tunnel 2 from left to right, as shown in Fig. 1, by means of a duplex conveyer consisting of a lower or primary conveyer member 10 and an upper or secondary conveyer member 11. These conveyers, moving together, are guided into the entrance end of the lehr by a roller 12 and after emerging from the tunnel 2 the conveyers pass over a sorting table composed of rollers 13. At the end of the sorting table the two conveyers are preferably separated and are returned toward the entrance end of the tunnel in separate paths. The primary conveyer 10, which is relied upon to take the strain of pulling the load through the lehr, passes around a roller 14, a driving drum 15, between the drum 15 and a pinch roller 16, and thence under an idle roller 17 and around

take-up rollers 18 and 19 to an idle roller 20. At the idle roller 20, the primary conveyer 10 is rejoined by the secondary conveyer 11, which has passed around a roller 21, somewhat offset from the roller 14, and around idle rollers 22, 23 and take-up rollers 24. The combined conveyer members are then guided by suitable idle rollers 25 to a roller 26, which directs them upwardly toward the roller 12 at the entrance to the tunnel.

The supporting and guiding arrangements just described may be considerably varied, according to the requirements of particular installations and are shown herein for illustration only.

Figs. 2 and 3 show one desirable way in which the primary and secondary conveyers may be constructed. As here shown, the primary conveyer 10 is composed of woven wire fabric which may be made up of intermeshing helical wires and may be made in alternate sections of right-hand and left-hand twist, as described in the Ingle patent mentioned above. The secondary conveyer 11, as shown, is also composed of woven wire fabric of square mesh in the example shown, and is of substantially smaller mesh than the primary conveyer 10, in order to present a smoother surface for supporting the articles to be conveyed. As stated above, the secondary conveyer may be made of any fabric, preferably of open-mesh, which is capable of passing around rollers and has a sufficiently smooth supporting surface.

Fig. 4 shows a modified construction in which a primary conveyer 30 is composed of slats, as in the old-style lehr construction mentioned above, and is associated with a secondary conveyer 31, which is indicated diagrammatically and may be similar in its construction to the secondary conveyer 11 or may be of larger mesh. In such an arrangement it may be found desirable to make the secondary conveyer 31 of relatively large mesh, such as that of the primary conveyer 10 of Figs. 1 to 3. In this way an old-style lehr, with a slat conveyer, may be equipped with a woven wire secondary conveyer similar to the conveyers used in the more modern type of lehr.

The use of a secondary conveyer with a primary conveyer of woven wire fabric makes it possible to reduce the cost of the primary conveyer, which can be made of coarser mesh than is necessary when such conveyer is to be used alone. The cost of the primary conveyer may also be reduced in other respects. For example, the meshes of the fabric do not need to be flattened when used with a secondary conveyer, as they should be if the primary conveyer is used alone.

The secondary conveyer is subjected to little or no wear, because it does not drag over the floor of the lehr tunnel. It is not necessary to provide any drive mechanism for the secondary conveyer, because it is carried by friction along with the primary conveyer. However, a separate drive for the secondary conveyer may be provided if desired, or both the primary and secondary conveyers may be passed together through the same driving mechanism, such as the drum and pinch roller arrangement described above. The primary and secondary conveyers may be permanently secured together by means of clips or the like, but such attachment is not ordinarily necessary.

The conveyer herein shown and described is adapted to various uses other than in annealing lehrs, and my invention includes such other uses.

I have shown and described constructions which are well suited for carrying my invention into practice, but it will be understood that variations may be made within the scope of the appended claims.

I claim as my invention:

1. A lehr conveyer comprising a plurality of reticulated endless conveyer members superposed one upon the other and having a substantially smooth ware supporting surface.

2. A lehr conveyer comprising a primary load-supporting endless conveyer member which takes the strain of pulling the load to be conveyed, and a second endless conveyer member superposed upon said primary conveyer member for directly supporting such load, said second conveyer member having a smoother surface than said primary conveyer member.

3. A lehr conveyer comprising a primary endless load-supporting conveyer for taking the strain of pulling the load to be conveyed, and a secondary conveyer of fine mesh open-work construction superposed upon said primary conveyer for directly supporting such load.

4. A lehr comprising a tunnel and a conveyer for transporting articles of glassware through said tunnel, the said conveyer comprising a rough surface primary endless conveyer member and a smooth surface secondary endless conveyer member superposed on said primary conveyer member.

5. A lehr comprising a tunnel, and means for transporting articles therethrough comprising a primary conveyer of woven wire fabric of relatively coarse mesh resting upon the floor of said tunnel, and a secondary conveyer of woven wire fabric of relatively fine mesh superposed upon said primary conveyer.

6. A lehr comprising a tunnel, and means for transporting articles therethrough comprising a primary conveyer of woven wire fabric of relatively coarse mesh resting upon the floor of said tunnel, a secondary conveyer of woven wire fabric of relatively fine mesh superposed upon said primary convey-

er, driving means for moving said primary conveyer through said tunnel, and means for guiding said secondary conveyer around said driving means without engagement therewith.

7. A lehr conveyer comprising a belt of low heat capacity having a substantially smooth supporting surface, and means for supporting said belt and taking the driving strains the last named means driving the belt by frictional contact alone.

8. A lehr conveyer comprising a belt having a large heat radiating area and a substantially smooth supporting surface, and means for supporting said belt and taking the driving strains the last named means driving the belt by frictional contact alone.

9. A lehr conveyer comprising a belt of low heat capacity having a large heat radiating area and a substantially smooth supporting surface, and means for supporting the belt and taking the driving strains the last named means driving the belt by frictional contact alone.

10. A conveyer for transporting hot articles having relatively small bottoms, comprising a belt of low heat capacity and having a substantially smooth surface, and means for supporting said belt and taking the driving strains the last named means comprising a second belt composed of wire fabric.

Signed at Hartford, Connecticut this 10th day of February, 1927.

JOHN C. ANDERSON.