May 30, 1933. M. MELNICK 1,911,961

CONVEYER

Filed Aug. 9, 1930

FIG. 1.

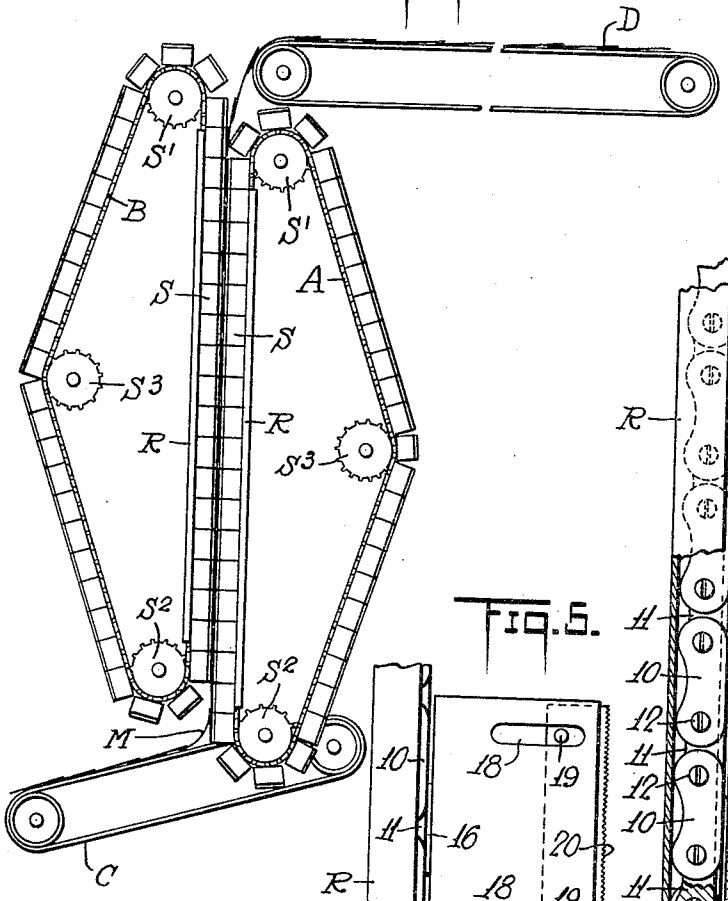


FIG. 2.

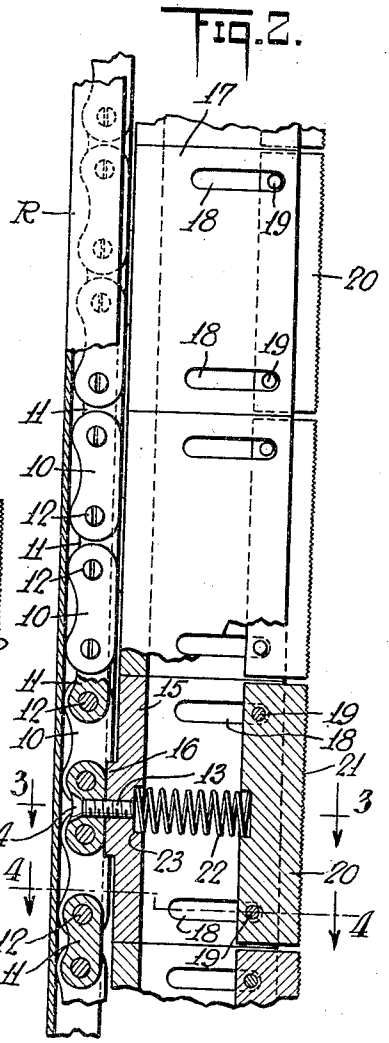


FIG. 5.

FIG. 3.

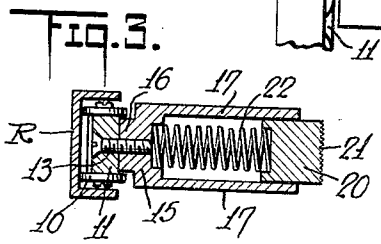
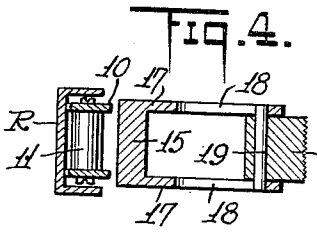


FIG. 4.



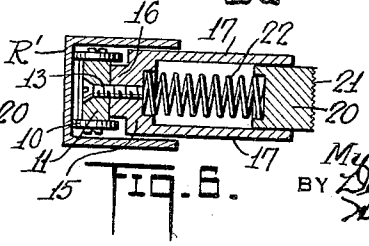


FIG. 6.

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B-120

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UNITED STATES PATENT OFFICE

MYER MELNICK, OF BRONX, NEW YORK

CONVEYER

Application filed August 9, 1930. Serial No. 474,181.

This invention relates to conveyers, and is particularly concerned with conveyer belts and conveyer systems for the conveyance of sheet material, such as paper or the like.

It is among the objects of the invention to provide a novel, simple and improved elevating conveyer adapted to firmly frictionally grip relatively fragile material and transport it.

Another object is to provide an elevating conveyer structure, self accommodating for variations in the thickness of the sheet material to be conveyed.

Another object is to provide a conveyer mechanism of simple, rugged, durable construction well suited to meet the requirements of economical manufacture and capable of ready repair in case of breakage or wear of the parts.

While the invention is broadly applicable, a preferred embodiment thereof is designed for the conveyance, particularly the elevating, of strip material such as flat or folded newspapers, the system includes one or more pairs of conveyer belts having parallel runs arranged for simultaneous vertical or horizontal movement, the belts including articulated traction blocks which are resiliently urged toward each other to grip the material and yield with sufficient freedom to automatically compensate for variations in the thickness thereof.

The preferred belt structure comprises a chain base of conventional form to certain links of which gripper blocks having yielding gripper faces are secured by a single securing device readily accessible so that the grippers may be conveniently removed or replaced.

In the accompanying drawing, in which is shown one of various possible embodiments of the several features of the invention,

Fig. 1 is a diagrammatical illustration of the system of the present invention.

Fig. 2 is a side elevation partly in section showing a preferred embodiment of the conveyer belt.

Fig. 3 is a transverse section taken on the line 3—3 of Fig. 2.

Fig. 4 is a similar section taken on the staggered line 4—4 of Fig. 2, and

Fig. 5 is a side elevation of one of the grippers with its gripping element thrust inwardly against the tension of its spring.

Fig. 6 is a view similar to Fig. 3 but illustrating a slight modification.

By referring to the diagrammatic illustration of the system shown in Fig. 1, it will be seen that any suitable number of pairs of cooperating conveyer belts A and B are provided, both of which are formed in accordance with the structure shown in Figs. 2 to 5. The belts of a pair include cooperating vertical runs S preferably guided in suitable rails R. Each belt beyond the ends of its rails is driven by a driving sprocket s^1, tracks around an idle sprocket s^2 and is tensioned by a tensioning sprocket s^3, these sprockets being shown in a purely diagrammatic fashion. The vertically moving, guided, operating run of the belt B is longitudinally offset with respect to the corresponding run belt A and material such, for instance, as partially folded newspapers is supplied between the belts from a horizontal conveyer C. This material is picked up by the lower end of the conveyer A and fed between the coacting sections S of the belts which carry it to a higher level. The extended uper portion of the conveyer B provides for directing the material M onto an upper horizontal conveyer D located, for instance, in the floor above conveyer C.

By referring to Figs. 2 to 5, it will be seen that each belt comprises a chain base formed of major links 10, coupled by intermediate connecting links 11 through the medium of pivot pins 12, by which construction a flexible belt chain is provided which may be modified to be of a roller bearing chain type, if desired. Mounted on the chain at suitable intervals, so that they laterally abut in a straight run of the chain, are gripper members. These members are preferably secured to the intermediate links 11 by headed securing screws 13 passing through the links, the heads 14 being countersunk

in the inner face of the chain to be easily available for engagement and disengagement by a screw driver or the like. The grippers comprise blocks substantially U shaped in cross section and including an intermediate base portion 15, which is enlarged as at 16, and internally threaded to receive the bolt 13 therethrough. The enlargement 16 provides for the slight spacing of the intermediate portion 15 with respect to the outer face of the chain to facilitate movement of the gripper blocks, as the chain passes over its supporting sprocket wheels.

From the base 15 side plates 17 extend, each plate having a pair of parallel elongated apertures 18, which receive therein cross pins 19 carried by movable gripper or traction bars 20. The outer faces of the bars are ribbed or otherwise shaped to provide frictional surfaces 21. The bars 20 are urged outwardly from the base 15 by coiled expansion springs 22, the inner ends of which are preferably seated within recesses 23 in the central portions of the bases 15. Outward movement of the bars from between the plates 17 is prevented by engagement of the pins 19 with the outer terminal ends of the slots 18. The bar is free to move inwardly against the tension of the spring 22, as guided by the pins. The structure will be seen to provide for bodily and direct inward movement, and due to the excess width of the slots, also for pivotal or rocking movement of the blocks between the plates.

In the operation of the device, it will be seen that the clearance provided between the base 15 and the major links permits the blocks to pass around the sprockets s^1, s^2 and s^3, as shown in Fig. 1, without interference therebetween. The bars when out of contact with the material will be urged by the springs 22 to their extended position, as shown in Figs. 2, 3, and 4. Material M is picked up by the lower end of the belt A and is moved therewith between cooperating sections S of the belts A and B. When the bars of the belt A come into cooperative relation with the bars of the belt B, the elements 20 are moved inwardly against the tension of the spring 22 and each pair of blocks cooperates to frictionally grip the material, rails R acting as reactance members to provide a firm base for the working rims of the conveyer.

It will be seen that the yielding gripper bars automatically compensate for the various thicknesses of material and permit pivotal movement of the elements when they first come in cooperative relation with the blocks of the opposite chain.

It will be understood that the invention is not confined to the direct parallel relation of the blocks of the various chains, as shown in Fig. 1. In some instances, it may be preferable to apply staggered relation of the different chains. It will be seen that the present invention thus provides a gripping conveyer chain, utilizing a conventional and inexpensive chain base upon which are mounted simple and effective gripping elements, the mounting of which is easily accomplished as is the removal thereof for purposes of replacement or repair.

Fig. 6 shows a slight modification utilizing guides R′ similar to guides R except that they are considerably deeper, actually embracing the gripper blocks 17 and positively limiting any tendency to lateral movement or twisting of such blocks.

It will thus be seen that there is herewith described apparatus in which the several features of this invention are embodied, and which apparatus in its action attains the various objects of the invention and is well suited to meet the requirements of practical use.

As many changes could be made in the above construction, and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter container in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

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

1. A conveyer belt including a flexible chain base, a plurality of U-shaped traction blocks secured to said base, each block having parallel sides and being open on one face, and a traction bar in each block disposed between said sides and guided thereby and being exposed through said open face.

2. A conveyer belt including a flexible base, U-shaped blocks secured to the base, each of said blocks being open on one face, and a traction bar in each block disposed between the sides thereof, said blocks and said bars having engaging means for guiding and retaining the bars, and said blocks containing springs urging said bars outward of said blocks.

3. A conveyer belt including a flexible chain base, U-shaped blocks open on one face secured to said base and having parallel sides, and a traction bar in each block between the sides thereof, said block containing means housed therein for engaging the bar, and causing one face thereof to project through the open face of the block.

4. A conveyer belt including a flexible chain base, U-shaped blocks carried by said base, each block having parallel sides and being open on one face, traction bars in the blocks between said sides, said bars and said blocks having guiding and retaining means

for the bars and resilient means in the blocks and housed thereby for engaging the bars and urging them outward therefrom to cause one face of the bars to project through the open faces of the blocks.

5. A conveyer comprising a belt made up of major links and relatively smaller connecting links, traction blocks and means for pivotally attaching said blocks to the connecting links at their mid points only, the ends of said blocks being disposed adjacent the ends of said major links.

6. A conveyer comprising a belt including a flexible chain base, traction blocks carried by the base, and means for pivotally attaching said blocks to the base at their mid points only, each of said blocks carrying a yieldable traction bar projecting therefrom to provide a gripping surface.

7. A conveyer belt comprising a flexible chain base made up of major links and relatively smaller connecting links, traction blocks carried by the base, means for attaching said blocks to the connecting links at the mid points only of said blocks, and a traction bar yieldably carried by each block and projecting therefrom to afford a gripping surface.

8. A conveyer system including a pair of belts having upward extending cooperating parallel runs and rails having channels along each of said parallel runs, said rails presenting their channels to each other, the runs of said belt lying between the rails and in said channels to be guided thereby.

9. A conveyer according to claim 8 wherein both the runs and the rails overlap at their ends.

10. A conveyer comprising a belt made up of major links and connecting links and traction blocks attached at their mid points only to the connecting links between the major links of said belt.

11. A conveyer comprising a belt containing links and traction blocks attached to said links, said blocks having sides separated by a recess opening through one face of the block, a bar in said recesses having pin-and-slot engagement with said sides and means in the block forcing the bars to project beyond the blocks along one edge.

Signed at New York, in the county of New York and State of New York this 8th day of August, A. D. 1930.

MYER MELNICK.