

Dec. 20, 1932.

L. R. SAGER

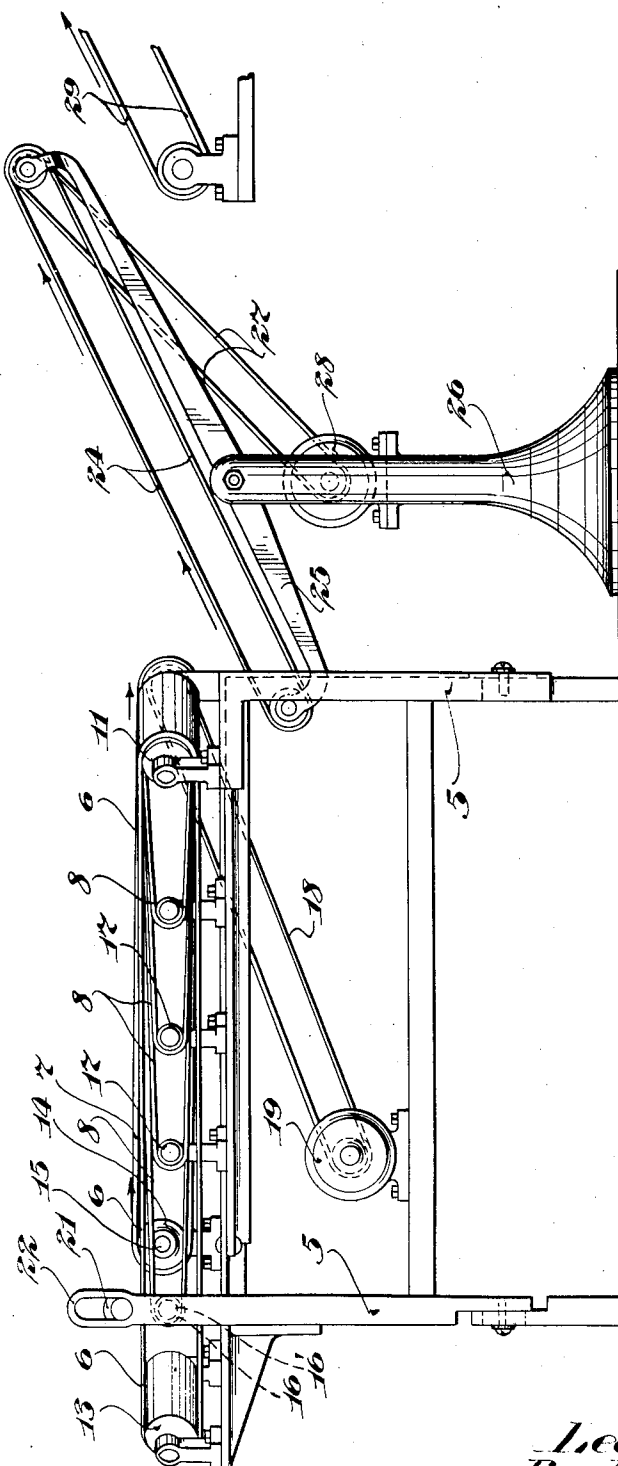
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LAUNDRY FLAT PIECE SPREADER

Filed Dec. 9, 1929

3 Sheets-Sheet 1

Fig. 1



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Dec. 20, 1932.

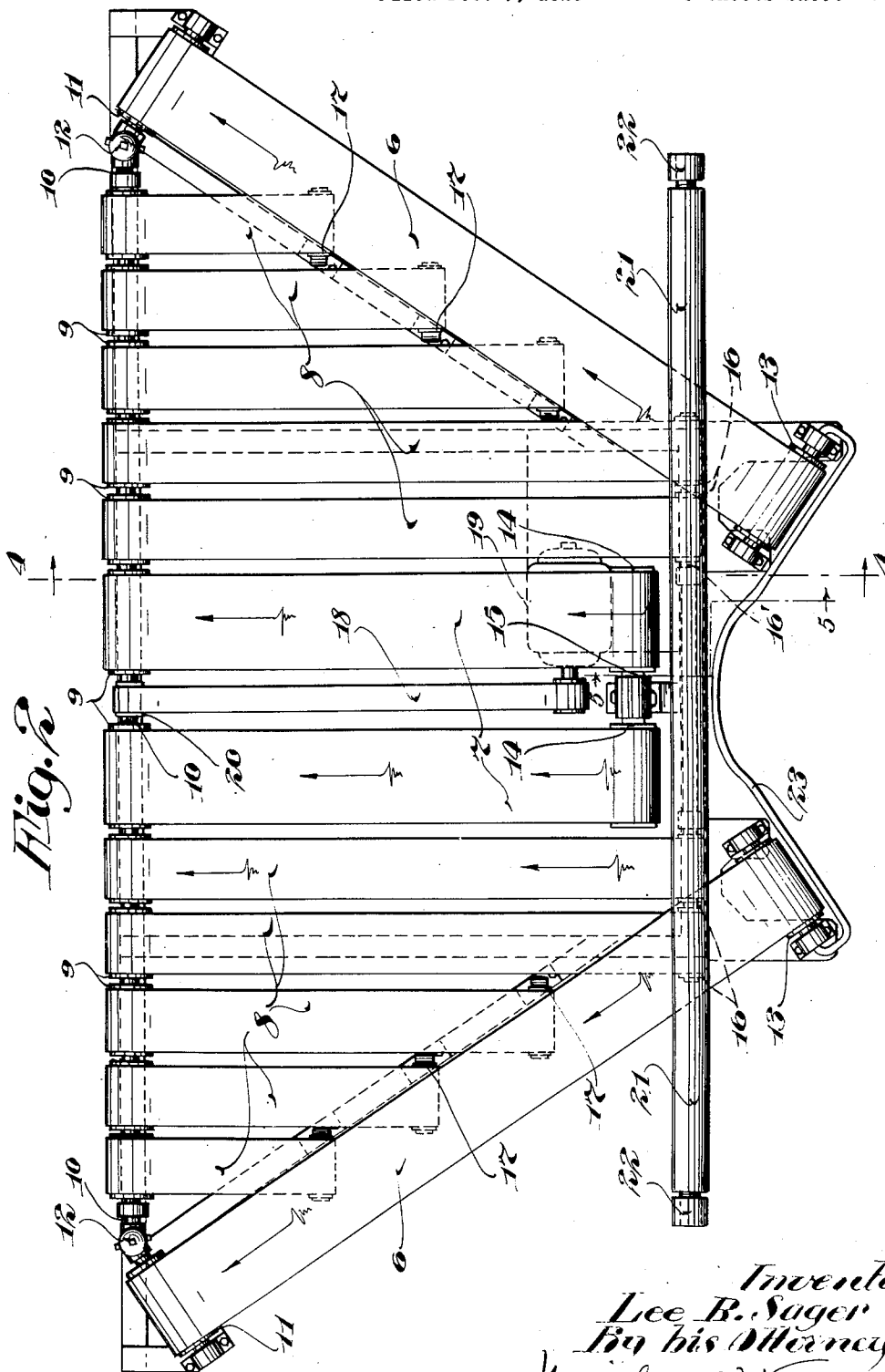
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LAUNDRY FLAT PIECE SPREADER

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3 Sheets-Sheet 2



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LAUNDRY FLAT PIECE SPREADER

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3 Sheets-Sheet 3

Fig. 3

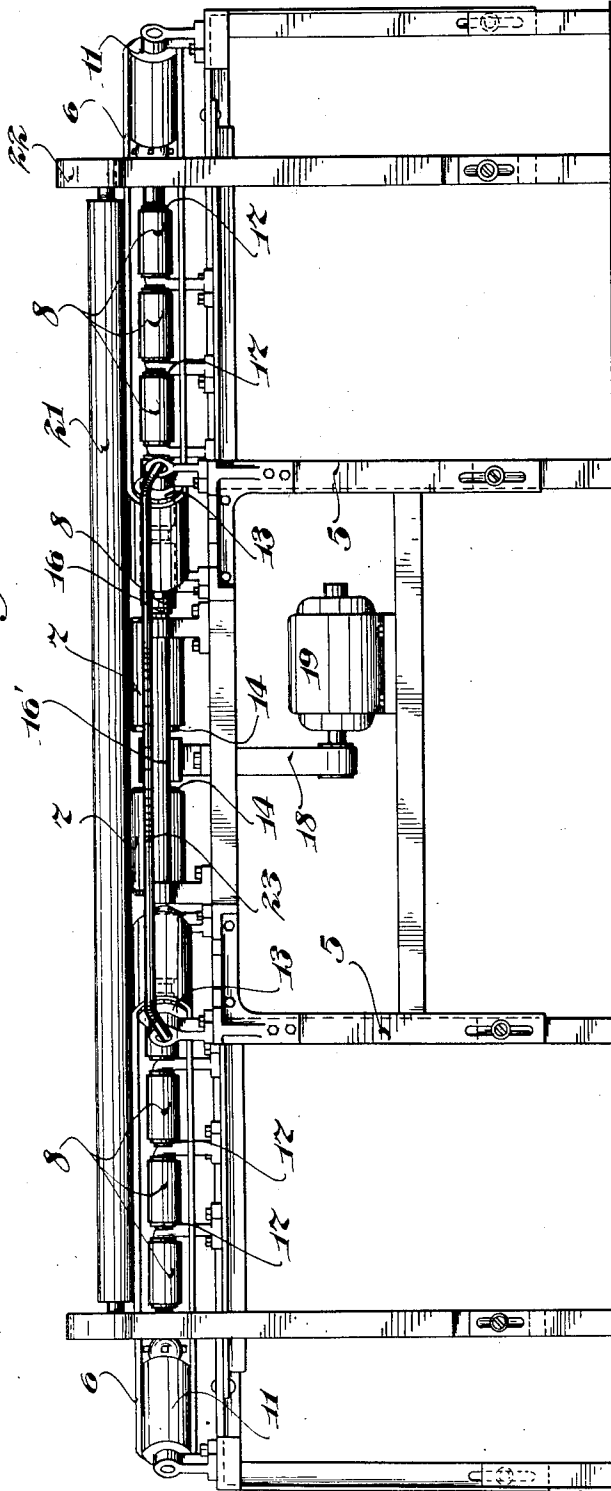


Fig. 4

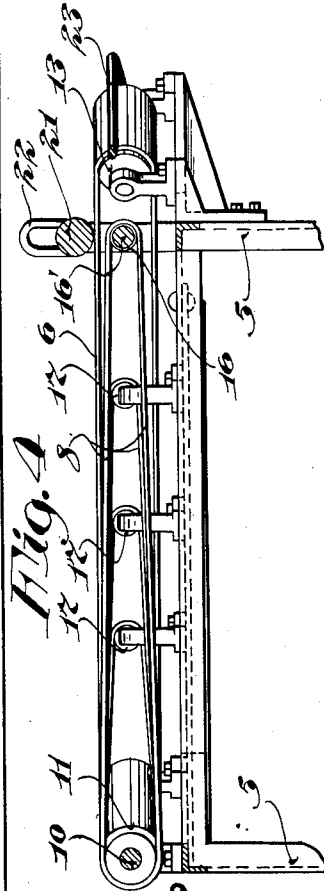
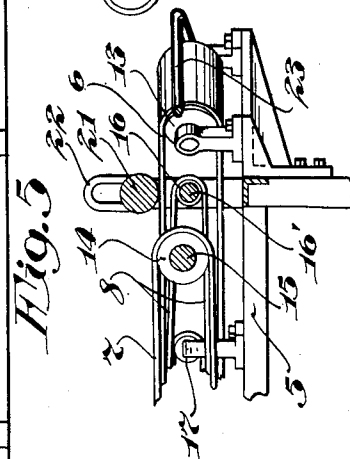


Fig. 5



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UNITED STATES PATENT OFFICE

LEE R. SAGER, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF ONE-THIRD TO ANTOINE WAYNE JULIEN, OF MINNEAPOLIS, MINNESOTA, AND ONE-THIRD TO MERTON A. POCKOCK, OF MINNEAPOLIS, MINNESOTA

LAUNDRY FLAT PIECE SPREADER

Application filed December 9, 1929. Serial No. 412,747.

My present invention has for its object to provide an extremely simple and highly efficient laundry flat piece spreader and to the above end, the invention consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

It is well known that flat pieces such as sheets, spreads and the like, as they are received from a wringer are loosely bunched or rolled and deposited in a basket. Before these flat pieces can be fed to a flat piece ironer they must be shaken out to smooth the same, usually folded once and placed on a rack which requires the work of two operators. From this rack the pieces are removed by two other operators and fed to an ironer. This method of handling flat pieces not only requires considerable time and work but the shaking thereof materially reduces the life of the pieces.

By the use of my present invention a single operator lifts the flat pieces one at a time from the basket, holds the same at one edge at two points within easy reach and with the piece between these two points taut and with the outer corner portions thereof hanging down. This held intermediate portion of the piece is placed on the spreader where the same is carried away from the operator and automatically spread at the same time throughout its entire width. From the spreader the piece may be deposited in a basket where the same is neatly and loosely folded throughout its entire width so that the piece may be lifted from the basket in reverse order from that in which it was fed to an ironer. Or, in some instances, the piece may be delivered directly from the spreader onto an elevator where the same is carried to an ironer and automatically fed thereto.

In the accompanying drawings, which illustrate the invention, like characters indicate like parts throughout the several views.

Referring to the drawings:

Fig. 1 is a right side elevation of the improved spreader and further diagrammatically illustrating one of the feed ribbons of a flat piece ironer and an elevator for conveying a piece from the spreader to the ironer;

Fig. 2 is a plan view of the spreader;

Fig. 3 is a rear elevation of the same;

Fig. 4 is a vertical section taken on the line 4—4 of Fig. 2; and

Fig. 5 is a view principally in vertical section taken on the irregular line 5—5 of Fig. 2.

The numeral 5 indicates a vertical adjustable frame on the top of which is mounted the laundry flat piece spreader that lies, as shown, in substantially a horizontal plane. This spreader includes a pair of forwardly diverging endless conveyor and spreader belts 6, a pair of central endless main conveyor belts 7 between said belt 6 and a plurality of endless secondary conveyor belts 8 between each belt 6 and the adjacent belt 7. All of the belts 7 and 8 at their forward ends run over individual rollers 9 on a transverse driven shaft 10 and the belts 6 at their front ends run over rollers 11 driven by universal couplings 12 on the ends of the shaft 10. The belts 6 and 7 at their rear ends run over individual rollers 13 and 14, respectively, the latter of which are on a transverse idle shaft 15. The two secondary belts 8 at each side of the main belts 7 at their rear sides run over relatively small rollers 16 on a transverse idle shaft 16' and the other of said belts 8 in each group at their rear ends run over individual idle rollers 17 of the same size as the rollers 16 and which other belts 8 are made progressively shorter from the rear of the device. The shafts 10, 15 and 16' and all of the rollers 13 and 17 are journaled in bearings on the frame 5.

The rollers 14 support the rear ends of the upper runs of the two main belts 7 at an elevation slightly above that of the upper runs of the belts 6 and the rollers 16 and 17 support the rear ends of the upper runs of the belts 8 at an elevation below the rear ends of the upper runs of the belts 6 and 7 and with the rear end portions of said belts 8 extending between the upper and lower runs of the belts 6, see Fig. 2.

The shaft 10 is driven by a belt 18 from an electric motor 19 on the frame 5 and which belt runs over a pulley on the shaft of said motor and a pulley 20 on the shaft 10 between the two belts 7. Cooperating with the two belts 6 is a floating pressure roll 21 journaled

in bearings 22 on the frame 5 and loosely resting on the upper runs of the belts 6 near the rear ends thereof and are rotated therefrom. The intermediate portion of the pressure roll 21 extends directly over the shaft 16' and the rollers 14 and shaft 15 are forward of the pressure roll 21 and as previously stated the rear ends of the upper runs of said belts are above the corresponding runs of the belts 6 and are also above the under surface of the pressure roll 21 which normally rests on the belts 6. Cooperating with the main conveyor and spreader belts 6 is an auxiliary fixed spreader 23 in the form of an inverse horizontal bow which extends between the receiving ends of said belts and its end portions which extend outward of said belts are bent upon themselves and rigidly secured in the outer bearings for the rollers 13.

Flat pieces such as sheets, spreads and the like to be spread or smoothed in preparing the same for a flat piece ironer are placed in a basket, not shown, as they are received from the wringer and said basket carried to the spreader and placed on the floor within the auxiliary spreader 23. The operator stands back of this basket, picks up the pieces one at a time at one edge thereof and holds the same at two points within easy reach and at the intermediate portion thereof which is held taut and with the outer corner portions of the piece hanging down.

The piece while thus held is laid over the two shoulders of the auxiliary spreader 23 and onto the belts 6 rearward of the pressure roll 21 with the corner portions of said piece hanging down over the outer longitudinal edges of the upper runs of said belts. As the piece is carried under the pressure roll 21 by the belts 6 the smooth intermediate portion thereof is carried under said pressure roll and onto the main conveyor belts 7 which, due to their higher elevation, raise the transverse center portion of the piece above the other belts 6 and 8. The weight of the pressure roll 21 is just sufficient to hold the piece on the belts 6 for movement therewith and pull said piece therewith onto the belts 7 and 8.

The piece is supported at its transverse center on the belts 7, outward thereof on the belts 8, and its outer longitudinal edge portions are supported on the belts 6. These diverging belts 6 draw the piece transversely in opposite directions from the two belts 7 and progressively pick up the hanging portions thereof and carry the same forward in a smooth or spread condition. As the hanging longitudinal edge portions of the piece are lifted by the belts 6 they are drawn over the outer longitudinal edges of the upper runs of said belts which puts sufficient tension thereon to stretch said piece in opposite directions from the belts 7. This transverse pull on the piece tends to lift the same in

respect to the belts 8 so that there is very little friction therebetween during the spreading of the piece. The belts 6 and 7 in drawing the piece forward under the action of the pressure roller 21 lift the same from the basket and draw its intermediate portion over the auxiliary stretcher 23 with the outer longitudinal portions thereof hanging straight down so that they are smooth as they are engaged by the diverging belts 6.

The primary object in supporting the rear end portions of the belts 7 at a higher elevation than the belts 6 and 8 is to carry the intermediate portion of the piece forward in a straight line and overcome any tendency of one of the oblique belts 6 to cause the piece to move obliquely therewith. This is particularly true in case the piece is not placed on the belts 7 at its true transverse center so that one side thereof is heavier than the other. The heavy side of the piece would, of course, tend to travel obliquely with the respective belt 6.

By the time the rear end portion of the piece passes over the delivery ends of the belts 6, 7 and 8 the entire piece has been smoothed.

In some instances the piece as the same is discharged from the spreader may be loosely folded into an underlying basket on the floor and thereafter carried to an ironer picked up, in reverse order from that in which they were fed to the spreader, and fed into the ironer. Or, as shown, the piece may be delivered onto an endless traveling elevator belt 24 mounted on front and rear rollers journaled in a frame 25 carried by a base 26. Preferably, the frame 25 is pivoted to the base 26 so that the inclination thereof may be varied, at will. Any suitable means may be provided for normally holding the frame 25 against pivotal movement. The upper roll over which the belt 24 runs is driven by a belt 27 from an electric motor 28 on said base. In place of a single belt the elevator may be made up of a multiplicity of relatively narrow edgewise spaced belts. From the elevator belt 24 the piece is delivered onto the ribbons 29 of a flat piece ironer.

From the above description it is evident that a single operator may very quickly and easily feed flat pieces onto the spreader which are automatically smoothed or spread thereby ready to be fed to a flat piece ironer.

What I claim is:

1. A device of the class described comprising a conveyor spreader including a pair of diverging endless belts, an endless main conveyor belt between said pair of belts, an endless secondary conveyor belt between the main conveyor belt and each belt of said pair, and means for driving said belts, the receiving ends of the secondary belts being below the upper runs of the pair of diverging belts.

2. A device of the class described compris-

ing a conveyor spreader including a pair of diverging endless belts, an endless main conveyor belt between said pair of belts, an endless secondary conveyor belt between the main conveyor belt and each belt of said pair, and means for driving said belts, the receiving end of the main belt being above the upper runs of the pair of diverging belts.

3. A device of the class described comprising a main conveyor spreader including a pair of diverging endless belts, an endless main conveyor belt between said pair of belts, an endless secondary conveyor belt between the main conveyor belt and each belt of said pair, means for driving said belts, the receiving end of the main belt being above the upper runs of said pair of belts and the receiving ends of the secondary belts being below the same, a pressure roll overlying said pair of belts at their receiving ends for cooperation therewith, and an auxiliary spreader at the receiving ends of said pair of belts, and extending laterally beyond the outer edge of each of the belts of the diverging pair.

4. A device of the class described comprising a main conveyor spreader including a pair of diverging endless belts, an endless main conveyor belt between said pair of belts, an endless secondary conveyor belt between the main conveyor belt and each belt of said pair, means for driving said belts, the receiving end of the main belt being above the upper runs of said pair of belts and the receiving ends of the secondary belts being below the same, and a holding roll overlying said pair of belts at their receiving ends.

5. A device of the class described comprising a pair of diverging conveyor spreader belts, means for positively operating the conveyor spreader belts, and a support between the conveyor spreader belts for loosely holding a piece of work with freedom for movement thereon toward the two diverging conveyor spreader belts.

6. A device of the class described comprising a pair of diverging conveyor spreader belts, a medial conveyor belt, a secondary conveyor belt between the medial conveyor belt and each conveyor spreader belt, and means for positively driving the several belts from their delivery ends, said positive driving means includes a single shaft over which the medial conveyor belt and the secondary conveyor belts run at their front ends, shaft sections angularly disposed in respect to the single shaft and substantially perpendicular to the diverging belts, said shaft sections being connected to the ends of said shaft by universal joints and over which shaft sections the respective ends of the conveyor spreader belts run.

7. A device of the class described comprising a pair of diverging conveyor spreaders on which a flat piece may be loosely placed

with its outer longitudinal edge portions hanging down from the outer longitudinal edge portions thereof, and means for positively moving the conveyor spreaders in the direction of their divergence, whereby the diverging spreaders will transversely stretch the flat piece therebetween and progressively lift the hanging portions thereof and spread the same on the conveyor spreaders.

8. The structure defined in claim 7 which further includes an auxiliary spreader at the receiving end of the device and from which auxiliary spreader the rear end portion of the flat piece may hang and be drawn thereover by the conveyor spreaders, said auxiliary spreader being extended outward of the outer longitudinal edges of the conveyor spreaders at their receiving ends whereby the flat piece will be transversely spread to a greater width than the distance between said edges.

9. The structure defined in claim 7 in which each conveyor spreader comprises a pair of rollers and a belt arranged to run over the two rollers, and which structure further includes an auxiliary spreader in the form of a horizontally disposed rod below the upper runs of the belts with its outer end portions extending outward of the outer ends of the two rollers at the receiving ends of the belts.

10. A spreader of the class described comprising a pair of endless belts that diverge from their receiving ends for loosely holding a piece of work with freedom for movement transversely thereof, and means for driving the belts.

11. A spreader of the class described comprising a pair of endless belts that diverge from their receiving ends, an endless main belt between the pair of diverging belts for loosely holding a piece of work with freedom for movement toward the belts of the diverging pair, and means for driving the belts.

12. A spreader of the class described comprising a pair of endless belts that diverge from their receiving ends, an endless main belt between the pair of diverging belts, and an endless secondary belt between each belt of the diverging pair and the main belt for loosely holding a piece of work with freedom for movement toward the belts of the diverging pair, and means for driving the belts.

13. The structure defined in claim 10 which further includes a holding roll cooperating with the upper runs of the two belts at the receiving end of the spreader.

14. The structure defined in claim 10 which further includes a holding roll cooperating with the upper runs of the two belts at the receiving end of the spreader, the axes about which the holding roll turns being perpendicular to a medial line between the two belts.

15. The structure defined in claim 10 which

further includes a floating holding roll which is supported on the upper runs of the belts at the receiving end of the spreader.

16. The structure defined in claim 10 which
5 further includes an auxiliary spreader at the receiving end of the spreader and which extends laterally beyond the outer edge of each of the belts.

17. The structure defined in claim 10 which
10 further includes an auxiliary spreader which extends across the receiving end of the spreader and laterally beyond the outer edges of the two belts.

18. The structure defined in claim 10 which
15 further includes an auxiliary spreader which extends across the receiving end of the spreader and laterally beyond the outer edges of the two belts, the outer end portions of the auxiliary spreader being substantially parallel to the axes about which the two spreader
20 belts at their receiving ends move.

In testimony whereof I affix my signature.

LEE R. SAGER.

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