May 2, 1939. J. E. ZOMNIR 2,156,419

MEANS FOR ASSEMBLING STRIPS OF FLEXIBLE MATERIAL

Filed March 2, 1938 3 Sheets-Sheet 1

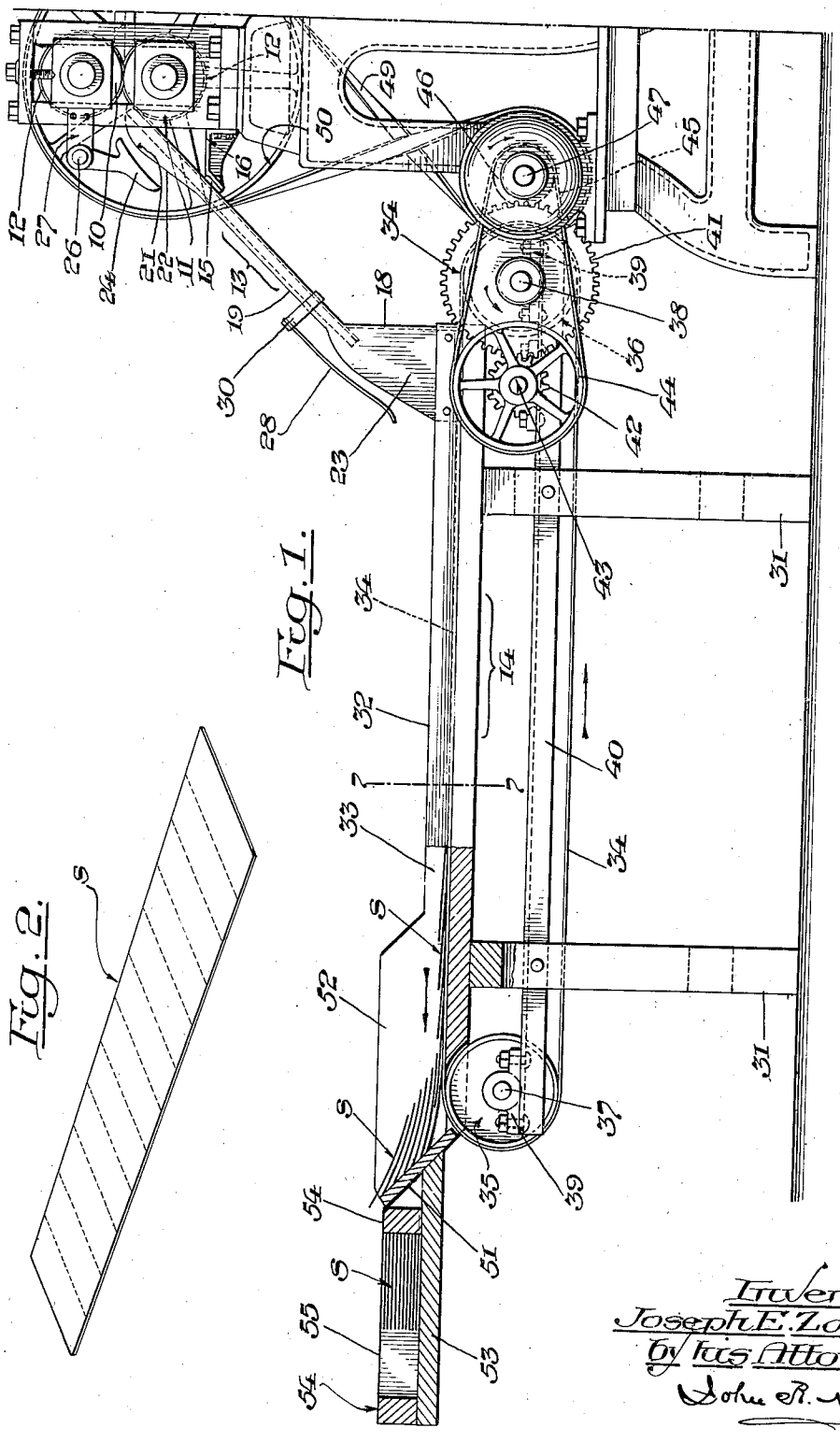


Fig. 1.

Fig. 2.

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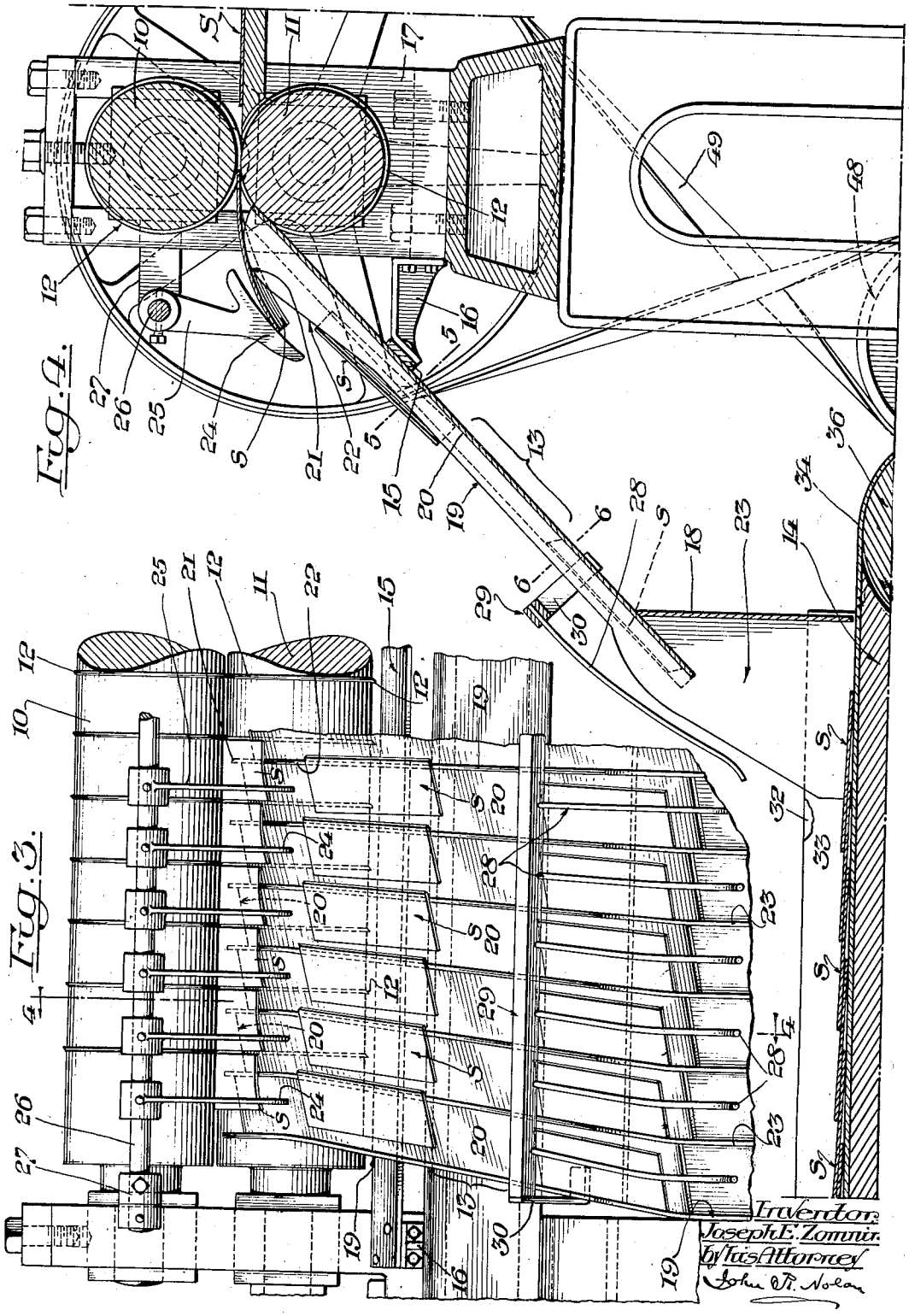


Fig. 4.

Fig. 3.

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Fig. 5.

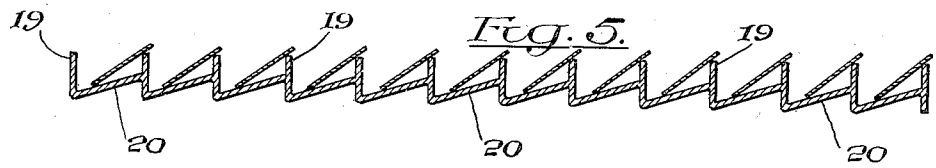


Fig. 6.

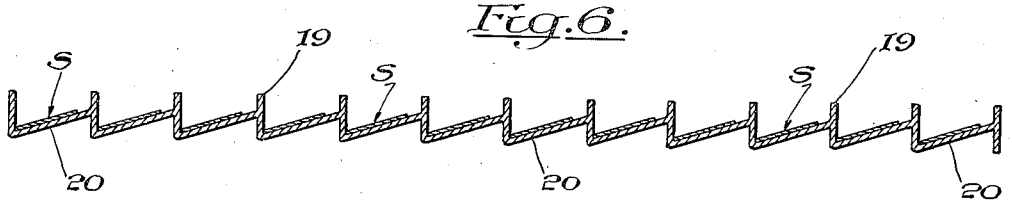
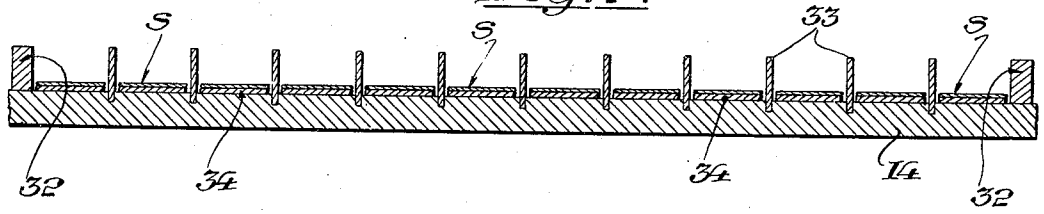


Fig. 7.



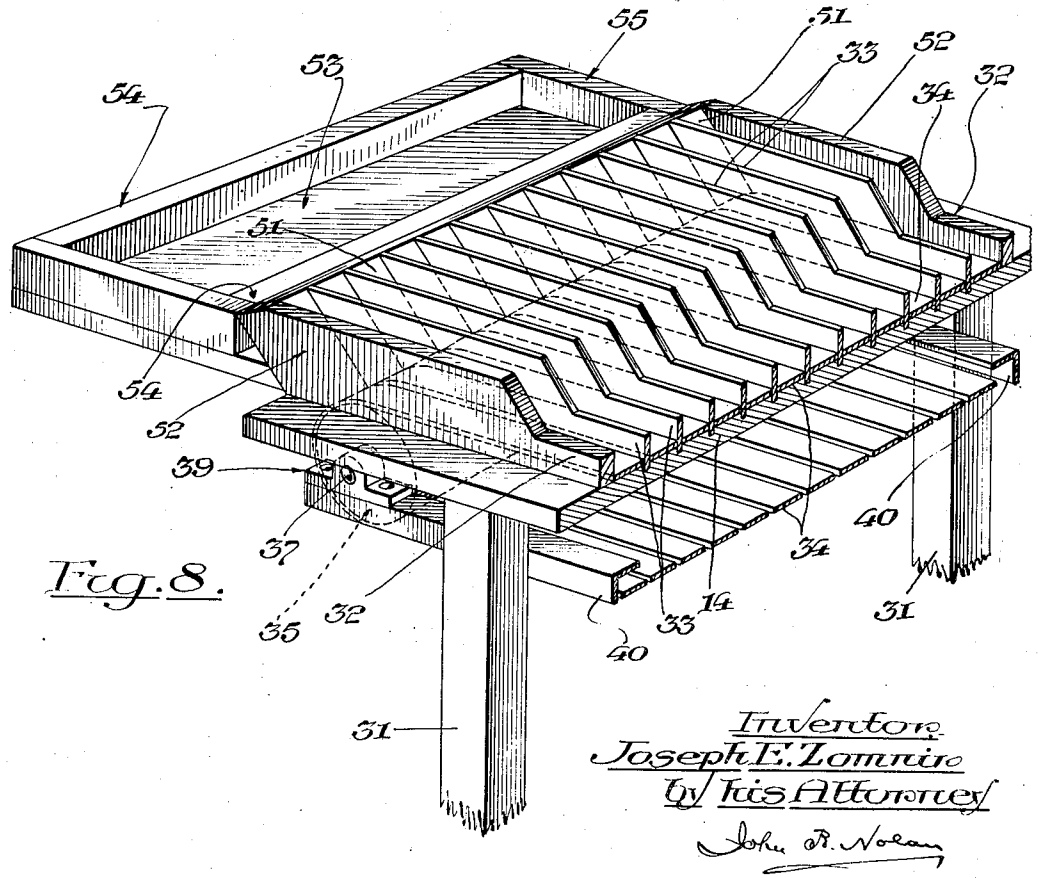


Fig. 8.

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UNITED STATES PATENT OFFICE

2,156,419

MEANS FOR ASSEMBLING STRIPS OF FLEXIBLE MATERIAL

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Application March 2, 1938, Serial No. 193,444

10 Claims. (Cl. 271—63)

This invention relates to mechanism for arranging in orderly overlapping relation relatively long strips of flexible material, such as paperboard, as they are rapidly produced and delivered by a multiple rotary slitting machine. The mechanism embodying my invention is especially, though not exclusively, designed to assemble in an efficient manner strips of paperboard, arranging them in segregated piles which are readily transferable to a machine effective to subdivide the strips into sections suitable for use as match book covers, for example.

The object of my invention is to provide simple and efficient mechanism whereby the flexible strips as they are discharged in rapid succession from the slitter, are arranged longitudinally in orderly overlapping relation and progressively assembled in groups, which mechanism in a preferred form will be hereinafter described and the scope of the invention expressed in the appended claims.

In the drawings—

Figure 1 is a side elevation of a portion of a multiple slitting machine equipped with strip assembling mechanism, shown partly in section, embodying the principle of my invention.

Fig. 2 is a view of one of the strips adapted to be subdivided transversely into match book covers or the like, as indicated by the spaced dotted lines.

Fig. 3 is an elevation of a portion of the cutter rolls and adjuncts of a slitting machine, showing the adjacent portion of an inclined channeled chute leading therefrom, and indicating the progressing strips within the chute.

Fig. 4 is a longitudinal vertical section, as on the line 4—4 of Fig. 3, showing, in addition, a portion of the assembling trough into which the strips are orderly delivered by the chute.

Figs. 5 and 6 are transverse sections of the inclined chute, as on the lines 5—5 and 6—6, respectively, of Fig. 4, showing the strips in succeeding positions within the chute.

Fig. 7 is a transverse section through the trough, as on the line 7—7 of Fig. 1.

Fig. 8 is a sectional perspective view of the rear of the trough, and adjuncts.

Referring to the drawings, 10 and 11 designate the continuously driven complementary cutter rolls of a rotary slitting machine of any usual or approved type. The peripheral cutters 12 of each of the rolls are arranged in spaced parallel relation, the two sets of co-acting cutters being adapted to subdivide into relatively long and narrow strips a sheet, S, (Fig. 2) of flexible stock, as, for example, paperboard, which is fed endwise into the bite of the rolls in the usual manner.

Adjacent the lower roll 11 is the upper end of a downwardly and rearwardly inclined chute 13 which leads from a position adjacent the bite of the rolls to the receiving end of a horizontal assembling trough 14 hereinafter described. In the present instance, the upper portion of the chute is supported by a cross-bar 15 which is secured at its ends to brackets 16 projecting from the standards 17 for the bearings of the cutter rolls, while the lower portion of the chute is supported upon a transverse member 18 fixed at the receiving end of the trough.

The chute is provided longitudinally thereof with a series of upstanding equally spaced parallel walls 19, which afford a series of channels corresponding in number with the coacting cutters and constructed and arranged to receive the respective strips, *s*, as they are endwise delivered by the cutter rolls. The floors 20 of the respective channels are inclined transversely throughout the length of the chute, as seen in Figs. 5 and 6.

The upper end portions of the channel walls 19 are enlarged and rounded, as at 21, tapering thence, as at 22, to the upper inclined edges of the respective walls 19. Such rounded portions are spaced laterally from the cutter rolls and so disposed in relation to the bite of the cutter rolls that the leading ends of the advancing strips, laterally of the longitudinal median line of the latter, initially pass to and rest upon the opposing rounded portions, while the major portions of the strips overhang the bottoms of the adjacent channels of the chute, it being noted that the strip which overhangs the bottom of each channel is supported upon the wall at the higher side of the bottom. See Fig. 3.

The lower ends of the channel walls 19 terminate in rearwardly and downwardly extended walls 23 of substantial area, which latter walls depend to or adjacent the floor of the receiving end of the trough, and are fixed to the channel walls of the latter and also to the supporting member 18.

Overhanging the paths of the respective strips which are supported on the rounded portions 21 of the walls 19, are a series of curved or inclined shoes 24 constituting presser members. These shoes are formed on or attached to depending arms 25 which are secured at spaced intervals to a transverse shaft 26 fixed in brackets 27 projecting rearwardly from the bearing standards

17. The leading ends of the strips as they pass from the cutter rolls encounter the opposing surfaces of the respective shoes 24, which shoes cam and direct such ends upon the rounded end portions 21 of the walls 19 and with the adjacent longitudinal edges of the strips deflected downward in the underlying channels. (See Fig. 4.) Thus the strips progress throughout their length upon the walls until the strips are fully incised by the cutters and freed from the rolls. Thereupon the strips are tilted, by gravity, into and longitudinally of the respective channels until the unsupported lower edges of the strips rest upon the opposing inclined floors 20 of the channels, as seen in Fig. 5. The strips, by virtue of their edgewise contact with the inclined floors, shift laterally until the strips fall flatwise into and longitudinally of the channels, as seen in Fig. 6. Such strips continue their orderly endwise descent within and along the channels until the strips escape the lower end of the chute, whereupon the strips pass between the adjacent vertical walls 23 and are thereby guided to and flatwise imposed in and longitudinally of the trough 14. Downwardly and rearwardly inclined spring fingers 28, which are secured at their upper ends to a bridge bar 29 spanning the lower portions of the chute channels, overlie the paths of the respective strips as they leave the chute, thus contributing to the guidance of the strips to the trough. The bar 29 is supported at its ends by brackets 30 which are secured to the respective sides of the chute.

In the present instance the assembling trough comprises an elongated horizontal bed supported by standards 31. The bed is provided with outer side walls 32, and intervening walls 33, the whole being arranged in spaced parallel relation to provide a series of longitudinal channels corresponding with and lying below those of the chute. The floors of the respective trough channels are constituted by the upper runs of a series of endless belts 34, which runs are supported upon and travel from the front to the rear of the bed. The belts pass about transverse rolls 35 and 36 having trunnions 37 and 38 which are journaled in bearing brackets 39 adjacent the respective ends of the trough bed. The brackets 39 are conveniently supported by lateral stringers 40 which are bolted to the standards 31. The forward roll 36 is suitably driven in timed relation with the cutter rolls. In the means herein illustrated for this purpose one of the trunnions of the forward roll has fast thereon a spur wheel 41 with which meshes a pinion 42 on a rearward shaft 43. Fast on the latter shaft is a pulley 44 which is connected by means of a belt 45 with a smaller pulley 46 fast on a suitably-disposed forward shaft 47. Also fast on the shaft 47 is a pulley 48 which is connected by means of a belt 49 with a larger pulley 50 fast on a trunnion of the lower cutter roll 11. Thus motion is transmitted by the belt 49 from the pulley 50 to the pulley 48, thence by the belt 45 to the pulley 44, the shaft 43 and its pinion 42; thence through the spur wheel 41 to the forward roll 36. (See Fig. 1.)

The speed of the upper runs of the belts 34 is such in relation to that of the cutter rolls that the succeeding strips, *s*, passing from the rolls to the chute channels, are deposited longitudinally of and in overlapping relation upon the respective belts under the lower end of the chute, thence the strips are carried by the belts to and against an upwardly and rearwardly inclined wall 51 at the rear of the trough. The rearward portions 52 of the walls 32 and 33 are extended upwardly to the height of the end wall 51, or substantially so, thus providing parallel chambers or "hoppers" within which the travelling strips are stacked in superposed relation and against the end walls, as seen in Fig. 1.

Extending rearwardly from the wall 51 is a transverse shelf 53 having upstanding sides and ends 54 and 55, respectively, the whole providing a tray into which the groups of stacked strips at the rear of the trough can be manually transferred preparatory to their removal to a separate machine for subdividing the strips into match covers or the like.

It is to be understood that my invention is not limited to the particular exemplifying form thereof herein disclosed, as the mechanism may be modified within the principle of the invention and the scope of the appended claims.

I claim—

1. Means for assembling elongated strips of flexible material as they are discharged lengthwise in succession from a slitting machine having cutters, comprising a downwardly inclined chute for the longitudinal guidance and descent of the said strips, said chute having longitudinal walls spaced laterally from the cutters, one of said walls arranged and adapted to receive and support the body of each succeeding strip laterally beyond the longitudinal median line of the strip until the strip has been freed from the cutters, and means whereby the longitudinal edge of the strip overhanging the space between the walls is downwardly deflected as the strip passes from the slitter.

2. Means for assembling elongated strips of flexible material as they are discharged lengthwise in succession from a slitting machine having cutters, comprising a downwardly inclined chute for the longitudinal guidance and descent of the said strips, said chute having longitudinal walls spaced laterally from the cutters, one of said walls arranged and adapted to receive and support the body of each succeeding strip laterally beyond the longitudinal median line of the strip until the strip has been freed from the cutters, and means whereby the longitudinal edge of the strip overhanging the space between the walls is downwardly deflected as the strip passes from the slitter, said means comprising a presser member overhanging the path of the longitudinally moving strip.

3. Means for assembling elongated strips of flexible material as they are discharged lengthwise in succession from a slitting machine having cutters, comprising a downwardly inclined chute for the longitudinal guidance and descent of the said strips, said chute having longitudinal walls spaced laterally from the cutters and a transversely inclined floor therebetween, the wall at the higher side of the floor arranged and adapted to receive and support the body of each succeeding strip laterally beyond the longitudinal median line of the strip until the strip has been freed from the cutters, such strip in its progress overhanging the inclined floor and tilting into contact therewith, thereby being shifted laterally from the supporting wall and dropping flatwise upon and longitudinally of the said floor.

4. Means for assembling elongated strips of flexible material as they are discharged lengthwise in succession from a slitting machine having cutters, comprising a downwardly inclined chute for the longitudinal guidance and descent of the

said strips, said chute having longitudinal walls spaced laterally from the cutters and a transversely inclined floor therebetween, the wall at the higher side of the floor arranged and adapted to receive and support the body of each succeeding strip laterally beyond the longitudinal median line of the strip until the strip has been freed from the cutters, and means for depressing each succeeding strip upon the opposing wall and deflecting one longitudinal edge of the strip into the space between the walls as the strip passes from the slitter.

5. Means for assembling elongated strips of flexible material as they are discharged lengthwise in succession from a slitting machine having cutters, comprising a downwardly inclined chute for the longitudinal guidance and descent of the said strips, said chute having longitudinal walls spaced laterally from the cutters and a transversely inclined floor therebetween, the wall at the higher side of the floor arranged and adapted to receive and support the body of each succeeding strip laterally beyond the longitudinal median line of the strip until the strip has been freed from the cutters, and means for depressing each succeeding strip upon the opposing wall and deflecting one longitudinal edge of the strip into the space between the walls as the strip passes from the slitter, said means including a depending cam member overhanging the upper portion of said space.

6. Means for assembling elongated strips of flexible material as they are discharged lengthwise in succession from a slitting machine having cutters, a downwardly inclined chute for the longitudinal guidance and descent of the said strips, said chute having longitudinal walls spaced laterally from the cutters and a transversely inclined floor therebetween, the wall at the higher side of the floor arranged and adapted to receive and support the body of each succeeding strip laterally beyond the longitudinal median line of the strip until the strip has been freed from the cutters, the upper or receiving end of said supporting wall having a rounded upward projection upon which the strip is initially deposited at the slitter, said projection merging with the plain upper edge of the supporting wall.

7. Means for assembling elongated strips of flexible material as they are discharged lengthwise in succession from a slitting machine having cutters, comprising a downwardly inclined chute for the longitudinal guidance and descent of the said strips, said chute having longitudinal walls spaced laterally from the cutters and a transversely inclined floor therebetween, the wall at the higher side of the floor arranged and adapted to receive and support the body of each succeeding strip laterally beyond the longitudinal median line of the strip until the strip has been freed from the slitter, the upper or receiving end of said supporting wall having a rounded upward projection upon which the strip is initially deposited at the slitter, said projection merging with the plain upper edge of the supporting wall, and presser means overhanging the space between the walls and in the path of each succeeding strip as it is formed and advanced by the slitter.

8. Means for assembling elongated strips of flexible material as they are discharged lengthwise in succession from a slitting machine having cutters, comprising a downwardly inclined chute for the longitudinal guidance and descent of the said strips, said chute having longitudinal walls spaced laterally from the cutters and a transversely inclined floor therebetween, the wall at the higher side of the floor arranged and adapted to receive and support the body of each succeeding strip laterally beyond the longitudinal median line of the strip until the strip has been freed from the cutters, such strip in its progress overhanging the inclined floor and tilting edgewise into the space between the walls so as to drop flatwise upon and longitudinally of the said floor, a trough located at the foot of the delivery end of the chute and having a longitudinally extending travelling carrier upon which the strips are successively discharged and thereby supported in longitudinal overlapping relation, and means for actuating said carrier in timed relation to the slitting machine.

9. Means for assembling elongated strips of flexible material as they are discharged lengthwise in succession from a slitting machine having cutters, comprising a downwardly inclined chute for the longitudinal guidance and descent of the said strips, said chute having longitudinal walls spaced laterally from the cutters and a transversely inclined floor therebetween, the wall at the higher side of the floor arranged and adapted to receive and support the body of each succeeding strip laterally beyond the longitudinal median line of the strip until the strip has been freed from the cutters, such strip in its progress overhanging the inclined floor and tilting edgewise into the space between the walls so as to drop flatwise upon and longitudinally of the said floor, a trough located at the foot of the delivery end of the chute and having a longitudinally extending travelling carrier upon which the strips are successively discharged and thereby supported in longitudinal overlapping relation, said trough having at its discharging end an abutment for the travelling strips, and means for actuating said carrier in timed relation to the slitting machine.

10. Means for assembling elongated strips of flexible material as they are discharged lengthwise in succession from a slitting machine having cutters, comprising a downwardly inclined chute for the longitudinal guidance and descent of the said strips, said chute having longitudinal walls spaced laterally from the cutters, one of said walls arranged and adapted to receive and support the body of each succeeding strip laterally beyond the longitudinal median line of the strip until the strip has been freed from the cutters, means whereby the longitudinal edge of the strip overhanging the space between the walls is downwardly deflected as the strip passes from the slitter, and a trough located at the foot of the delivery end of the chute and having a longitudinally extending travelling belt upon which the strips are successively discharged and therewith supported in longitudinal overlapping relation, and means for actuating said belt in timed relation to the slitting machine.

JOSEPH E. ZOMNIR.