

June 16, 1953

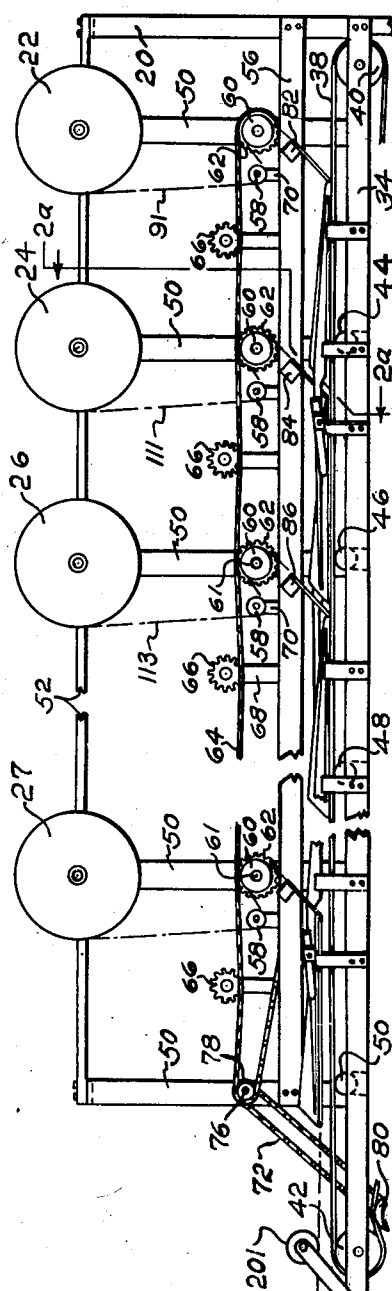
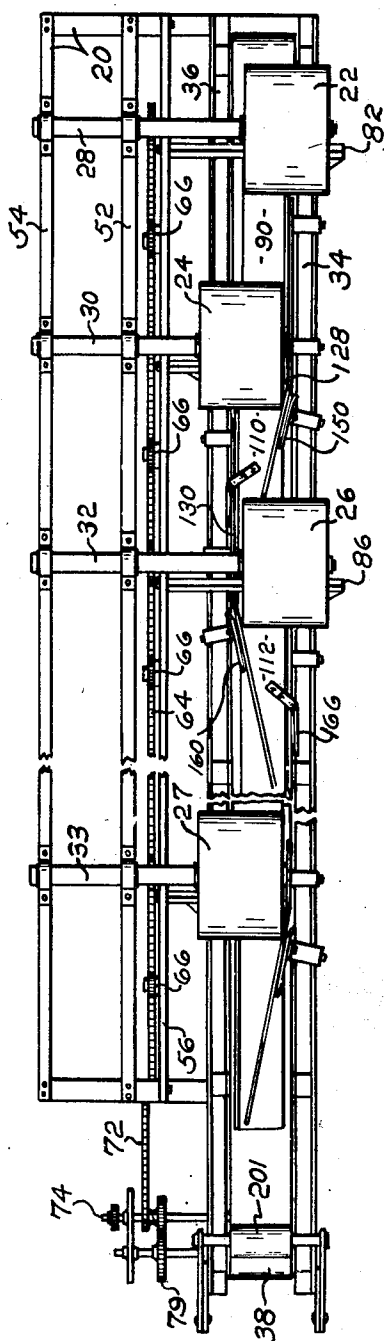
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2,642,279

WEB INTERFOLDING APPARATUS AND METHOD

Filed Feb. 21, 1950

4 Sheets-Sheet 1



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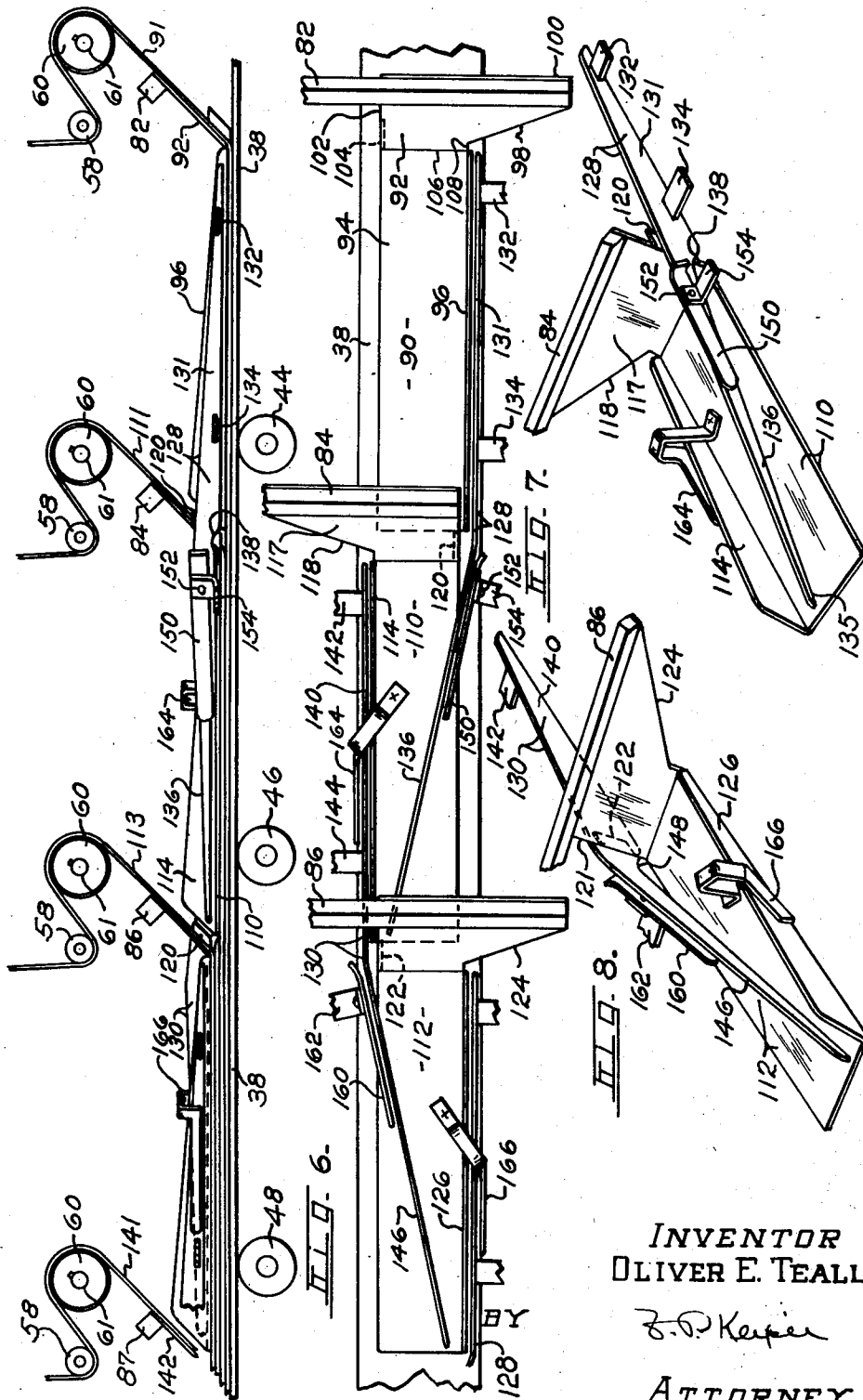
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FIG. 5.



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FIG. 9.

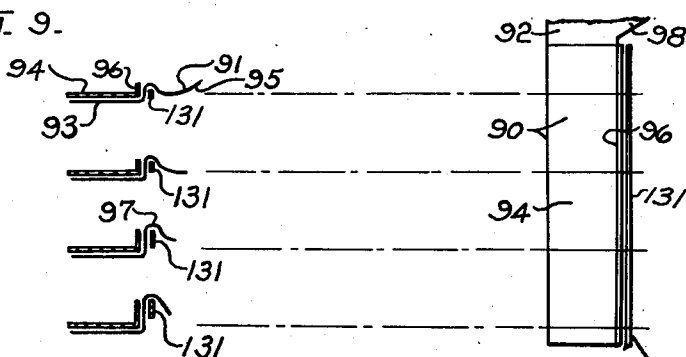


FIG. 10.

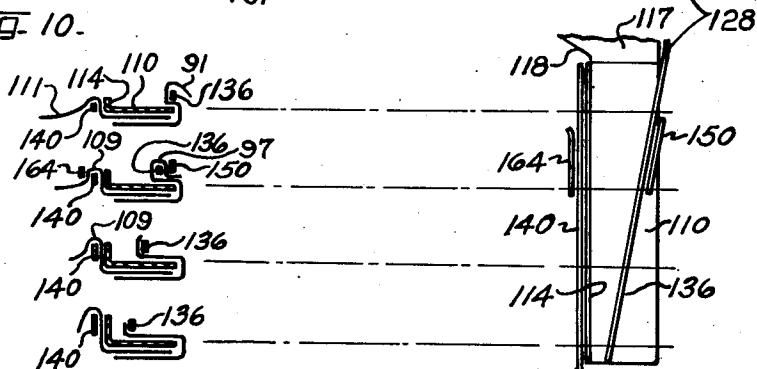


FIG. 11.

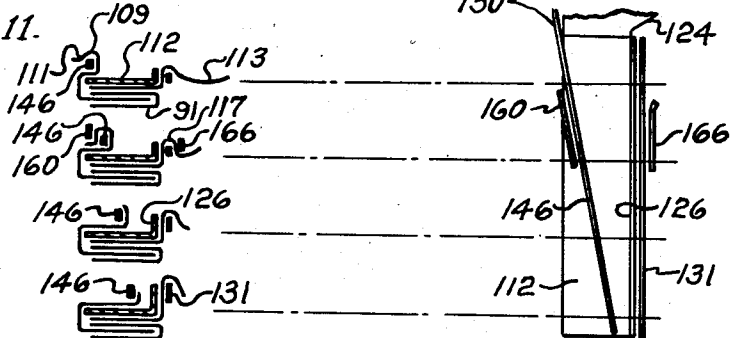
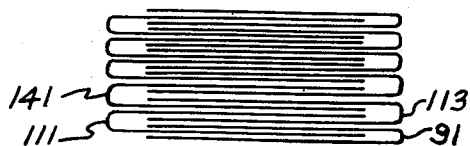


FIG. 12.



FIG. 13.



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WEB INTERFOLDING APPARATUS
AND METHOD

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Application February 21, 1950, Serial No. 145,418

18 Claims. (Cl. 270—40)

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This invention relates to interfolding apparatus, and more particularly to an apparatus and method for continuously longitudinally interfolding strip material into a multiple interfolded layer stack of tissue, toweling or other cellulosic material.

Heretofore the multiple layer interfolded stacks of tissue, toweling and the like, have been produced with the fold arranged transverse of the web supply, and the interfolding and stacking operation operated on a single stack basis, resulting in a relatively slow operation.

The present invention relates to the drawing of webs from a series of supply rolls arranged along a laying-up conveyor, and in which the successive webs are caused to be interfolded along lines longitudinally thereof. The invention more particularly relates to a continuous operation wherein sheet material in web form flows steadily from a series of rolls through forming devices associated with each roll, and in which interference during interfolding of the webs is completely eliminated.

The invention further has to do with the provision of forming devices adapted to operate on a series of staggered sheet material supply sources, wherein successive sheets partially overlap the previous sheets, and in which the non-overlapped portions are caused to be folded to form interfolds as the material is assembled in a continuously flowing growing stack. The final stack continuously flowing unbroken from the apparatus thus contains as many individually interfolded webs as there are supply rolls.

The above and other novel features of the invention will appear more fully hereinafter from the following detailed description when taken in conjunction with the accompanying drawings. It is expressly understood that the drawings are employed for purposes of illustration only and are not designed as a definition of the limits of the invention, reference being had for this purpose to the appended claims.

Referring to the drawings, wherein like reference characters indicate like parts:

Figure 1 is a top plan view of the machine, intermediate duplication of parts having been eliminated;

Figure 2 is a side elevation of the machine as shown in Figure 1;

Figure 2a is a transverse broken section taken through the machine, substantially on the line 2a—2a of Figure 2;

Figure 3 is a fragmentary detail in side elevation, showing the driving coordination between the various moving parts;

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Figure 4 is a fragmentary detail of the output end of the conveyor and drive mechanism, shown substantially in top plan;

Figure 5 is an enlarged side elevation of three successive interacting feeding and folding horns or shoes, with web thicknesses only indicated;

Figure 6 is a top plan view of Figure 5, but with the webs eliminated;

Figure 7 is a perspective of a left hand horn or shoe, and fingers;

Figure 8 is a perspective of a right hand horn or shoe and fingers;

Figures 9, 10, 11 and 12 are diagrammatic views of three successive horns and the starting end of a fourth, respectively, illustrating in progressive stages and interfolding operation as it is successively performed;

Figure 13 is a diagrammatic cross-sectional view indicating the nature of the interfold which may be produced.

In Figures 1 and 2, there is shown a frame 20 which normally would extend in length to accommodate as many rolls of web stock, corresponding to the number of interfolds desired to be laid up. In practice, the number may be 50 or more rolls, and if facial tissue or the like, each roll may contain two-ply tissue with the grain extending lengthwise and creped transversely. Accordingly, but the initial three rolls and an end roll are shown, with their respective mechanism, since the mechanism for each roll, or rather pair of rolls, is repetitive.

Alternate rolls 22 and 26 are offset with respect to intermediate rolls 24 and 27, assuming an even number of rolls is employed, by approximately half of the width of the web stock. Such rolls are mounted on spindles 28, 30, 32 and 33, and auxiliary spindles (not shown) may be provided adjacent each roll to carry a reserve roll, so that as one roll is spent, a second roll may be fed in in overlapping relation without interruption to the operation.

The frame consists of a pair of spaced parallel angle members 34 and 36, extending the length of the machine, between which is mounted a conveyor belt 38, the same extending between end rolls 40 and 42, and the upper reach riding over spaced rolls such as 44, 46, 48 and 50 along the length of the belt. To one side of the frame may be provided spaced uprights 50 and upper horizontal bars 52 and 54 carrying the stock roll spindles 28, 30, 32 and 33. Also a side rail or bar 56, extending along the length of the conveyor to one side and somewhat above is provided to accommodate certain mechanism as will appear.

Beneath each supply roll is a free-running idler or guide roll 53, and a feed roll 60, each of the latter having common driving mechanism including sprockets 62 and chain 64; the chain also engaging idler sprockets 66 between each two feed rolls to assure engagement. The idler sprockets 66 and guide rolls 53 may be journaled on shafts supported on brackets 68 and 70 extending respectively from rail or bar 56, while the feed rolls may be mounted on shafts 61 journaled in the uprights 50. It will be appreciated that the idler rolls and feed rolls will be alternately staggered to correspond with the supply rolls with which they cooperate, and the feed roll may be treated with a friction face to positively engage the web material to assure a positive feed, the idler rolls providing a half wrap around the feed roll for such purpose.

The rate of feed of the feed rolls 60 is co-ordinated with the conveyor belt travel through a second chain drive 72, connecting the power drive shaft 74 with an end jack shaft 76 having sprocket 78 over which one end of the chain 64 passes. The power drive shaft is provided with a belt engaging roll 80, and gearing 79 to a second shaft having the end roll 42, the gearing and rolls 80 and 42 having the same diameter ratios, whereby the rolls 80 and 42 assure positive drive of the conveyor belt at the desired speed and co-ordinated with the feed rolls 60 on shafts 61.

The rail 56 also supports a series of shoes one for each roll supply, the shoes being alternately rights and lefts, as will appear in Figures 5, 6, 7 and 8. Each shoe comprises a horizontal portion, and an inclined head portion rigidly secured to cantilever support bars 82, 84, 86 and 87, mounted on the rail 56, the bars 82, 84, 86 and 87 extending horizontally and transversely across the belt 38.

The initial shoe 90 comprises an inclined guiding head 92 rigidly secured to the bar 82, and a horizontal shoe portion 94 having a side flange 96, of gradually increasing height. The shoe portion 94 is somewhat wider than half of the width of the web stock 91, and the inclined guiding head is provided with a forming or slack producing inclined edge 98 extending to the right, the guiding head being somewhat wider than the web stock at the bar support edge 100. The edge 102 of the inclined head is provided with a small guide flange 104, and the inclined edge 98 terminates short of the bend or juncture 106 between head 92 and shoe portion 94, as is indicated at 108.

A series of shoes such as 110 and 112, lefts and rights but otherwise similar, are arranged in tandem along and over the length of the conveyor belt 38, the shoes being rigidly supported as by bars 84, 86, etc. The shoe 110 has a flange 114 similar to the flange 96 of shoe 90, but on the left side, and the inclined head 117 is provided with a forming or slack producing incline 118. Similarly, a small guide flange 120 is provided similar to the flange 104 of shoe 90, and such flange may in effect be a continuation of the flange 96, or slightly offset from alignment therewith.

Shoe 112, like shoe 90, is provided with a guide flange 122, a forming or slack producing inclined edge 124 and side flange 126 of gradually increasing height. The guide flange 122 may be in substantial alignment with, or slightly offset from the flange 114 of shoe 110.

Forming fingers, right and left hand, 128 and 130, extend along the respective right and left

flanges of the successive shoes, such fingers also extending diagonally across the immediately following shoe. Alternate fingers 128 (right hand) comprise a supported section 131 of gradually increasing height to correspond with the rising flanges 96 and 126, etc., of the right hand shoes and are of a length similar to the flanges. Support brackets 132 and 134 extend to angle iron 34, and hold the section 131 of each of the fingers 128 in suitably spaced relation from their respective flanges 96, 126, etc. The free end of the finger 136 is somewhat relieved on its under edge by an offset 138 and thereafter extends diagonally across the plate portion of the shoe 110. The free end gradually decreases in height as is indicated, terminating in a tip 135.

A left hand finger 130 of similar shape to finger 128, but reversed, has a supported section 140, supported by brackets 142 and 144 from the angle iron 36, with a free portion 146 extending diagonally across the succeeding shoe 112, there being an offset 148 where the finger bends about the guide head 121 of shoe 112 in slight spaced relation thereto.

It will be understood that a web of paper stock 91 is fed at belt speed to the guide head 92 of shoe 90, with the left hand half of the stock moving down the guide head 92 and being fed along beneath the shoe portion 94. The right hand portion of the web is provided with a "short cut," by reason of the inclined edge 98, providing sufficient slack, so that the right hand portion may travel over the supported end 131 of the finger 128 between the finger and flange 96.

The web stocks 91 and 113, as shown in Figure 5, are actually indicated as thicknesses only, to avoid hiding the essential elements. The actual course taken by the web stocks 91, 111, 113, 141, etc., are diagrammatically indicated in the sectional views of Figures 9 to 12, inclusive, as will appear hereinafter.

A reference to Figure 9 will show successive stages diagrammatically of the approximate section through the web stock as it progresses along the shoe 90, with the left portion 93 beneath the shoe and the right portion 95 between the flange 96 and finger part 131. As the height of the finger 128 (supported section 131) progressively increases, the free half of the web is gathered in a fold 97 of increasing height. Such fold is positioned along the edge of the shoe, and in readiness for folding over the succeeding web stock 111, fed beneath the guide head 117 and shoe 110.

The web stock 111 is fed onto the guide head 117 with its right hand half directed for travel beneath the shoe portion 110, and with the left hand portion passing under the inclined edge 118, producing slack in such left hand portion for subsequent riding over the supported end of the left hand finger 130. The left hand portion is gradually formed into a fold of gradually increasing height.

A reference to Figure 10 will show the manner in which the free left portion of the web 111 is gradually formed into a fold 109 of increasing height, as the stock progresses along the shoe 110 and over the supported portion 140 of the finger 130. While the fold 109 of web 111 is being formed of increasing height, the previously formed fold 97 of web 91 is gradually moved across the upper surface of shoe 110 by the free end 136 of finger 128. The finger reduces in height to accommodate the gradual reduction in loop height, which loop height must gradually

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reduce as a substantial portion of the free edge of web 91 is laid over the shoe 110.

As the webs 91 and 111 travel to the succeeding shoe 112, a third web 113 is fed to the guide head 115 of shoe 112, with the left half directed beneath the shoe 112, and the right half passing beneath the edge 124, to produce a degree of slack in the right hand free portion of web 113. The slack of web 113 is caused to form a shallow fold over the finger 128 associated with shoe 112, such fold increasing in height as the web travels along the shoe 112.

As diagrammatically shown in Figure 11, the free right hand half of the web 113 after passing beneath edge 124 is formed into a fold of gradually increasing height over the rigid portion 131 of finger 128 associated with shoe 112. At the same time, the left hand portion or fold 109 of web 111 is gradually swept across the upper surface of the shoe 112, the fold 109 gradually decreasing in height as the web is flattened across the shoe 112.

As the webs 91, 111 and 113 leave the shoe 112, a fourth web 141 is fed into the guide head of a fourth left hand shoe, and as indicated in Figure 12, the preceding operation described in Figure 10 commences, that is, the free edge or loop 117 of web 113 is swept across the succeeding shoe, while the free left hand edge of web 141 is gradually formed into a fold of increasing height.

The series of webs thus fed on the conveyor form a stack of longitudinally interfolded sheets as shown in Figure 13. The number of sheets depends upon the length of the apparatus, and particularly the number of supply rolls and forming shoes employed. It will be seen that successive shoes will be mounted on the rail 56 at slightly increased heights, to accommodate the accumulating stack of interfolded webs. It will also appear that the rolls 40, 42, etc., are located so as to lend support to the conveyor belt in correct relation to their respective shoes, although the weight of said shoes is largely borne by torsion of the support bars 82, 84, 86, etc.

In describing the action of the shoes and fingers, reference to additional fingers for effecting a guiding action to the free edges of the webs has been avoided, such auxiliary fingers not affecting the principle of operation but acting to smoothen such operation. Such fingers as will be described may be associated with each shoe, where the fold is being formed or moved across a shoe.

In Figure 7, there will be seen adjacent the free end 136 of finger 128, a short finger 150 freely pivoted as at 152 on a bracket 154 mounted on rail 34. The rounded end of such finger rides on the free edge of web 91 in the manner diagrammatically shown in Figure 10, as it is formed over shoe 110. The weight of the finger 150 is sufficient to prevent the web edge from fluttering as it passes along the forming finger 128. A similar finger 160 may be pivotally mounted on a bracket 162 from angle 36 in conjunction with each finger 130, as shown in Figure 11.

Additional guide fingers serve to smooth the operation such as left finger 164 and right finger 166, secured to left and right shoes 110 and 112 as by welding. Such fingers loop over their respective shoe flanges and guide the free edge of the web in the initial forming stage of the loop as is indicated in Figures 10 and 11.

It will be seen that the fingers 128 and 130 actually provide, as the web passes over the supported portions 131 and 140, respectively, a tem-

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porary continuous storage device acting to move the outboard half of the web into a fold, in readiness for smoothing or sweeping such outboard half across the inboard portion of the subsequent web while being fed beneath its respective shoe. Just as soon as the previous outboard web is swept across the shoe, it together with the interfolded inboard web of the subsequent web pass beneath the next shoe, with the inboard portion of still another web superimposed. It will be seen that the folding operation is automatic, successive webs first undergoing an inboard portion laying up stage, while the outboard portion is first stored in a delaying stage while being positioned in readiness for folding over followed by a folding over and smoothing out stage. During the stored or delaying stage, the outboard portion of the previous web is undergoing the folding over and smoothing out stage.

The finished interfolded web stock, comprising 50 or more interfolds, may emerge from the apparatus beneath a guide roll 201 in a continuous stream at a rate in the order of several feet per second, after which it may be fed to a cutting machine adapted to transversely cut the stock into sections of uniform length for packaging and delivery to the trade. It will be seen that the apparatus provides a fast, positive interfolding operation, which may be utilized to interfold practically any form of sheet material of the general type described.

While the folding operation has been described as functioning to fold over approximately a half of the web, to provide the interfold, it will appear that the folded over portion may be of lesser width, for example, a third the web width, or in fact any desired proportions may be effected by the apparatus described, it being only necessary to vary the degree of staggered or offset relation and the relative shape of the fingers. The term median has been used to denote the line of the fold, and not necessarily the exact web center line.

Although an apparatus has been illustrated and described having proportions generally suitable for the handling of delicate facial tissue of one or more plies having limited strength, it will appear that the invention is not limited thereto. As various changes in the construction, arrangement, and proportion of the parts may be made to accommodate materials having differing elasticity, strength, grain, and other characteristics without departing from the spirit of the invention or over-all method, as will be apparent to those skilled in the art, reference will be had to the appended claims for a definition of the limits of the invention.

What is claimed is:

1. The method of interfolding tissues and the like to provide a multiple stack of interfolded tissues which comprises, continuously feeding and bringing together in sequence a series of webs at intervals spaced lengthwise thereof, with alternate webs offset laterally with respect to the remaining webs, by an amount equal to a fraction of the width of said webs, whereby each web as fed has a longitudinal inboard section lying in overlapping relation to a prior web and an outboard longitudinal interfolding section adapted to be folded over the inboard section, guiding the outboard section of each web clear of the overlapping section while laying the inboard section of the immediately subsequent web over the folded outboard section of the prior web, and smoothing said outboard interfolding section over

the inboard section of said subsequent web prior to the laying of the inboard section of the next succeeding web.

2. The method of interfolding webs of cellulosic material and the like to provide a multiple stack of interfolded webs which comprises, continuously feeding and bringing together in sequence a series of webs of uniform width at intervals spaced lengthwise thereof, with alternate webs offset laterally with respect to the remaining webs by an amount equal to substantially half of the width of said webs, whereby each web beyond the first web as fed has a longitudinal inboard section lying in overlapping relation to the immediately previous web and an outboard longitudinal remaining section adapted to be folded over the inboard section, guiding the outboard section of each web temporarily clear of the inboard section while laying the inboard section of the immediately subsequent web over the folded outboard section of the previous web, and smoothing said outboard section over the overlapping inboard section of said subsequent web prior to the laying of the inboard section of the next succeeding web.

3. The method of continuously interfolding a series of webs in sequence to produce a multiple stack of interfolded webs, which comprises moving a web lengthwise thereof, with the portion to one side of a longitudinal median held in flat formation, while gathering and temporarily storing the remainder in a longitudinally extending fold clear of the portion held in flat formation, introducing and superimposing in offset relation a second web upon said first web for movement therewith and with the portion of the second web to the other side of the median thereof held in flat formation, laterally moving the fold of said first web across the superimposed portion of the second web, while gathering and temporarily storing the remainder of the second web in a longitudinally extending fold preparatory to lateral movement thereof over a third web to be subsequently introduced and superimposed in alignment with said first web.

4. The method of continuously interfolding a series of webs in sequence to produce a multiple stack of interfolded webs, which comprises moving a web lengthwise thereof, with the portion to one side of a longitudinal median held in flat formation, while gathering and temporarily storing the remainder in a longitudinally extending fold clear of the portion held in flat formation, introducing and superimposing in offset relation a second web upon said first web for movement therewith and with the portion of the second web to the other side of the median thereof held in flat formation, laterally moving the fold of said first web across the superimposed portion of the second web, while gathering and temporarily storing the remainder of the second web in a longitudinally extending fold, introducing and superimposing a third web upon said last named web in offset relation thereto, but in alignment with said first web, with the portion to said one side of a longitudinal median held in flat formation, and laterally moving the fold of said second web across the flat held portion of said third web, while temporarily storing the remainder of the third web in a fold preparatory to lateral movement thereof over a fourth web to be subsequently introduced and superimposed in alignment with said second web.

5. The method of continuously interfolding a

series of webs in sequence to produce a multiple stack of interfolded webs, which comprises moving a web lengthwise thereof with the portion to one side of a longitudinal median in flat formation while gathering and temporarily storing the remainder portion in a longitudinally extending fold clear of the portion held in flat formation, introducing and moving a second web in offset relation over the previous web with the portion to the other side of the median of the second web overlying said first named web portion held in flat formation, moving said fold over said overlying second portion and smoothing to flat formation, while temporarily storing the remainder of said second web in a longitudinally extending fold, moving a third web in substantial alignment with said first web, with a portion to one side of a longitudinal median in flat formation and overlying the portion of said second web held in flat formation.

6. The method of continuously interfolding a series of webs in sequence to produce a multiple stack of longitudinally interfolded webs, which comprises moving a web lengthwise thereof with the portion to one side of a longitudinal median in flat formation while temporarily storing the remainder in a longitudinally extending fold clear of the portion held in flat formation, moving a second web in offset relation over the previous web stock, with the portion to the other side of the median of the second web overlying said first named web portion held in flat formation, moving said fold over said overlying second portion and smoothing to flat formation, while temporarily storing the remainder of said second web in a longitudinally extending fold in readiness for moving over a third web subsequently moving upon the previous first and second webs, the third web being located in alignment with the first web and offset with respect to said second web.

7. In an interfolding machine, a conveyor belt, a plurality of means for feeding a web strip upon said conveyor located at spaced points along the length of said conveyor belt, alternate feeding means being offset laterally with respect to the remaining feeding means, each feeding means comprising a smoothing member adapted to overlie and extend along a section of the web strip and cover said strip to one side of the median of said strip, and a finger having a longitudinally extending portion for gathering the remainder of said strip in a longitudinal fold while traveling along and beside said smoothing member, said finger extending in the direction of flow and having a second portion extending diagonally across the subsequent smoothing member to move the fold across said subsequent member, and smoothen said remaining side over said subsequent member.

8. In an interfolding machine, a conveyor belt, a plurality of means for feeding a web strip upon said conveyor located at spaced points along the length of said conveyor belt, alternate feeding means being offset laterally with respect to the remaining feeding means, each feeding means comprising a smoothing member adapted to overlie and extend along a section of the web strip and cover said strip to one side of the median of said strip, a slack-producing guide for the remaining side of said strip, and a finger having a longitudinally extending portion for gathering said slack in a longitudinal fold while traveling along and be-

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side said smoothing member, said finger extending in the direction of flow and having a second portion extending diagonally across the subsequent smoothing member to move the fold across said subsequent member, and smoothen said remaining side over said subsequent member.

9. In an interfolding machine, a conveyor belt, a plurality of means for feeding a web strip upon said conveyor located at spaced points along the length of said conveyor belt, alternate feeding means being offset laterally with respect to the remaining feeding means, each feeding means comprising a smoothing member adapted to overlie and extend along a section of the web strip and cover said strip to one side of the median of said strip, a slack-producing guide for the remaining side of said strip, and a finger having a longitudinally extending portion for gathering said slack in a longitudinal fold while traveling along and beside said smoothing member, said finger extending in the direction of flow and having a second portion extending diagonally across the subsequent smoothing member to move the fold across said subsequent member, and smoothen said remaining side over said subsequent member, said smoothing members being arranged substantially in alignment along said conveyor belt.

10. In an interfolding machine, a conveyor belt, a plurality of means for feeding a web strip upon said conveyor located at spaced points along the length of said conveyor belt, alternate feeding means being offset laterally with respect to the remaining feeding means, each feeding means comprising a smoothing member adapted to overlie and extend along a section of the web strip and cover said strip to one side of the median of said strip, a slack-producing guide for the remaining side of said strip, and a finger having a longitudinally extending portion for gathering said slack in a longitudinal fold while traveling along and beside said smoothing member, said finger extending in the direction of flow and having a second portion extending diagonally across the subsequent smoothing member to move the fold across said subsequent member, and smoothen said remaining side over said subsequent member, said smoothing members being arranged substantially in alignment along said conveyor belt, and said guides alternating from left to right.

11. In an interfolding machine, means for conveying a continuous web of material, means for feeding a series of web strips upon said conveying means at spaced points therealong, each strip in part overlying previous strips fed on said conveyor means, alternate web strips being offset laterally from the remaining web strips by approximately half the width of the web strips, whereby approximately one-half of each strip is laid over one-half of the previous strip, means associated with each of said feeding means for moving the other half of the strip bed thereby to a position for folding, and means for thereafter smoothing said other half over the subsequent overlying half of the subsequent strip.

12. An interfolding apparatus for forming a multiple stack of longitudinally arranged inter-folds, comprising a conveyor, means for delivering a series of webs to said conveyor at spaced points therealong, alternate webs being

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offset by approximately half of the web width, a forming shoe associated with each web, and mounted above said conveyor belt in parallel relation thereto, said shoes being arranged in tandem and spaced along the conveyor in accordance with the points of delivery of the series of webs upon the conveyor, and each shoe being adapted to overlie portions of said webs alternating from one side to the other of the web medians, and means associated with each shoe for gathering the remaining portion of each web, said means extending along the side of the shoe adjacent the median of the web passing immediately thereunder and across the succeeding shoe and guiding said remaining portion in a fold over the overlie portions of the immediately successive web.

13. An interfolding apparatus for forming a multiple stack of longitudinally arranged inter-folds, comprising a conveyor, means for delivering a series of webs to said conveyor at spaced points therealong, alternate webs being offset by approximately half of the web width, a forming shoe associated with each web, and mounted above said conveyor belt in parallel relation thereto, said shoes being arranged in tandem and spaced along the conveyor in accordance with the points of delivery of the series of webs upon the conveyor, and each shoe being adapted to overlie portions of said webs alternating from one side to the other of the web medians, and means associated with each shoe for gathering the remaining portion of each web, said means extending along the side of the shoe adjacent the median of the web passing immediately thereunder and across the succeeding shoe and guiding said remaining portion in a fold over the shoe immediately following while the overlie portion of the immediately successive web passes beneath said succeeding shoe.

14. An interfolding apparatus for forming a multiple stack of longitudinally arranged inter-folds, comprising a conveyor, means for delivering a series of webs to said conveyor at spaced points therealong, alternate webs being offset by approximately half of the web width, a forming shoe associated with each web, and mounted above said conveyor belt in parallel relation thereto, said shoes being arranged in tandem and spaced along the conveyor in accordance with the points of delivery of the series of webs upon the conveyor, and each shoe being adapted to overlie portions of said webs alternating from one side to the other of the web medians, and means associated with each shoe for gathering the remaining portion of each web, said means extending along the side of the shoe adjacent the median of the web passing immediately thereunder and across the succeeding shoe and guiding said remaining portion in a fold over the overlie portions of the immediately successive web, said shoes having inclined guide heads, with alternate oppositely disposed slack producing guides, and having associated therewith a finger of gradually increasing height to receive the remainder portion of each web and form a fold, said finger extending diagonally across the following shoe, to move the fold across the overlie portion and smoothen the remainder over said following shoe.

15. In an interfolding machine, a conveyor belt, a frame extending along said conveyor belt, a series of shoes supported above and in parallel

relation to said conveyor belt from said frame, said shoes being in tandem relation along the length of said belt, each of said shoes having a lengthwise extending flange along one edge, and a guide head at one end for feeding web stock beneath said shoe, said guide head having an extension to the side of said flange with an inclined slack producing inclined guide edge, said shoes with respect to said flange and guide head alternating in rights and lefts, means for feeding web stock to said guide heads with a substantial portion passing beneath said shoe and the remainder under said edge, and a finger associated with each shoe and extending along said flange and in spaced relation thereto and supported from said frame, each of said fingers having a free end extending beyond its respective shoe and diagonally across said succeeding shoe, said fingers being alternately right and left handed to correspond with their respective associated shoes.

16. In an interfolding machine, a conveyor belt, a frame extending along said conveyor belt, a series of shoes supported above and in parallel relation to said conveyor belt from said frame, said shoes being in tandem relation along the length of said belt, each of said shoes having a lengthwise extending flange along one edge, and a guide head at one end for feeding web stock beneath said shoe, said guide head having an extension to the side of said flange with an inclined slack producing inclined guide edge, said shoes with respect to said flange and guide head alternating in rights and lefts, means for feeding web stock to said guide heads with a

substantial portion passing beneath said shoe and the remainder under said edge, and a finger associated with each shoe and extending along said flange and in spaced relation thereto and supported from said frame, each of said fingers having a free end extending beyond its respective shoe, around the guide head of the succeeding shoe and diagonally across said succeeding shoe, said fingers being alternately right and left handed to correspond with their respective associated shoes, and means for power actuating said feeding means and coordinated with the speed of said conveyor belt.

17. A machine in accordance with claim 15, in which an auxiliary finger supported from said frame is mounted in substantial parallelism and spaced relation to the free end of each of the first mentioned fingers.

18. A machine in accordance with claim 15, having a shoe mounted auxiliary finger extending parallel with said flange in lateral spaced relation thereto.

OLIVER E. TEALL.

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