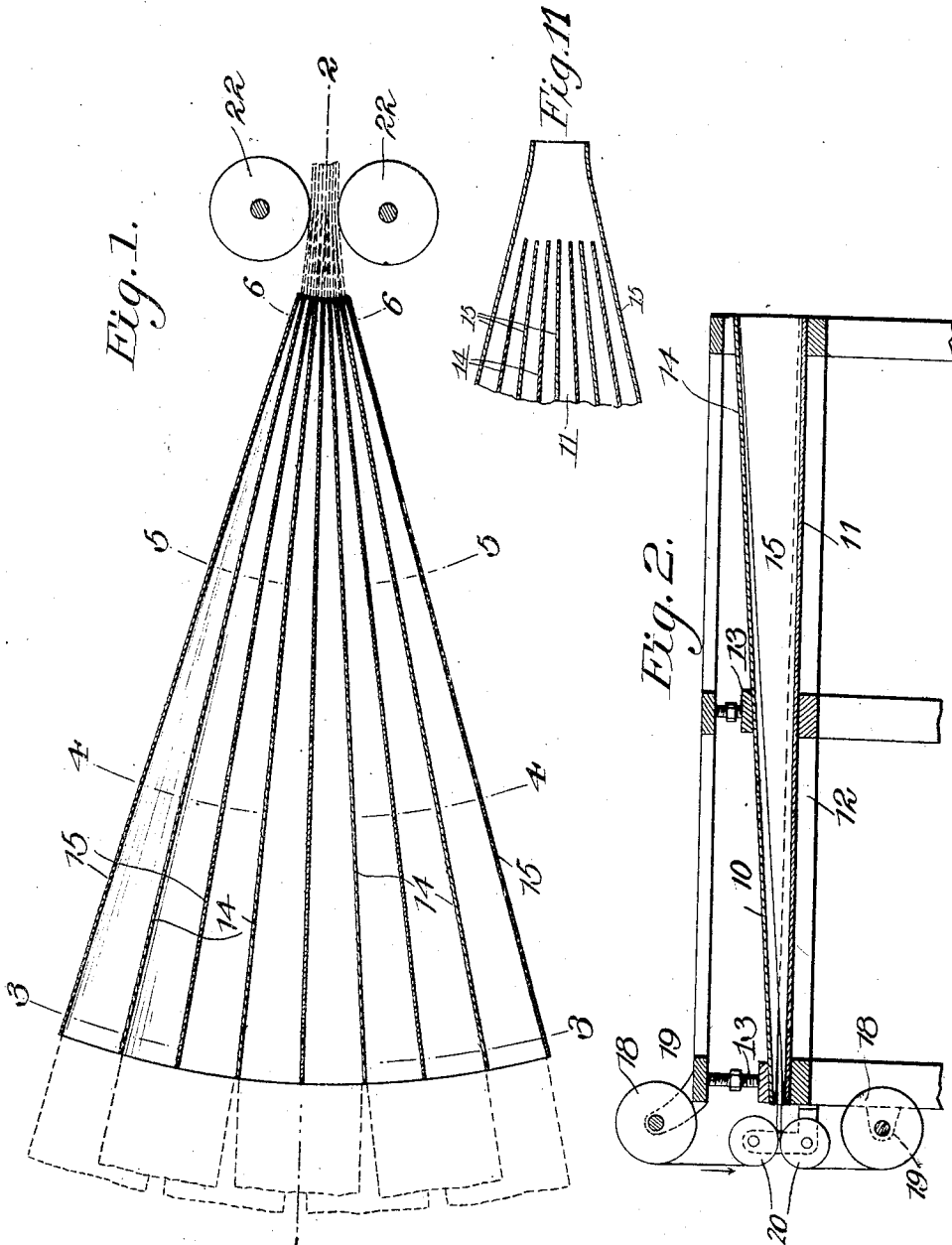


No. 813,593.

PATENTED FEB. 27, 1906.

A. E. SEXTON.
PAPER FOLDING MACHINE.
APPLICATION FILED AUG. 17, 1903.

3 SHEETS—SHEET 1.



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3 SHEETS—SHEET 2.

Fig. 3.

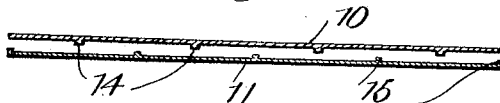


Fig. 4.

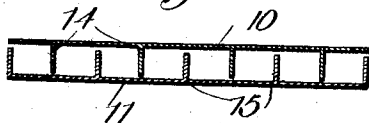


Fig. 5.

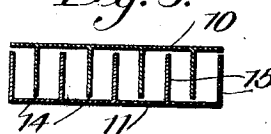
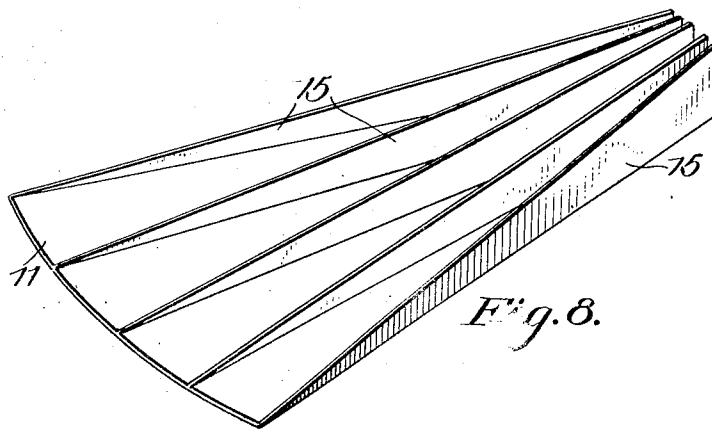


Fig. 6.



Fig. 7.



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3 SHEETS—SHEET 3.

Fig. 9.

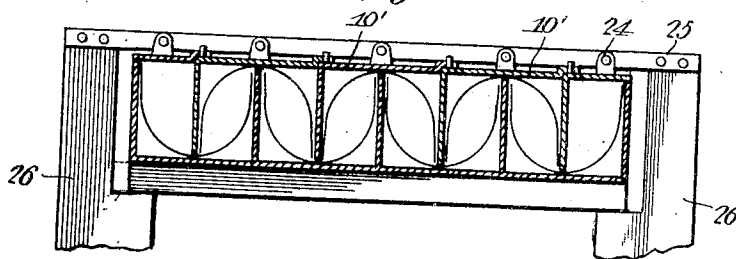
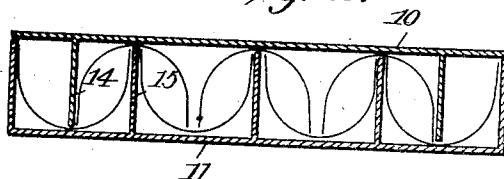


Fig. 10.



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UNITED STATES PATENT OFFICE.

ARTHUR E. SEXTON, OF LOS ANGELES, CALIFORNIA.

PAPER-FOLDING MACHINE.

No. 813,593.

Specification of Letters Patent.

Patented Feb. 27, 1906.

Application filed August 17, 1903. Serial No. 169,817.

To all whom it may concern:

Be it known that I, ARTHUR E. SEXTON, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Paper-Folding Machine, of which the following is a specification.

The present invention relates to machines for the interfolding of strips or ribbons of paper in order to form a web that is afterward severed into short lengths of a size convenient for use.

The principal object of the invention is to provide a novel form of folding-machine by means of which the strips or ribbons may be handled with certainty and properly interfolded with each other without danger of tearing the strips during the folding operation.

A further object of the invention is to provide a machine of this character in which the frictional contact between the paper and the folding devices is reduced to a minimum and objectionable strain from this source obviated.

A further object of the invention is to provide a device of this character in which a separate inclosing and guiding means is formed for each strip or ribbon being folded, said inclosing and guiding means serving also to instantly correct lateral movement of the strips or ribbons during the folding operation.

With these and other objects in view, as will hereinafter more fully appear, the invention consists in the novel construction and arrangement of parts hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportion, and minor details of construction may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a sectional plan view of a paper-folding machine constructed in accordance with the invention. Fig. 2 is a longitudinal sectional elevation of the same on the line 2-2 of Fig. 1. Figs. 3, 4, 5, and 6 are views on a somewhat larger scale, being cross-sections taken on the lines bearing corresponding designating-numerals in Fig. 1. Fig. 7 is a diagram illustrating the product of the machine. Fig. 8 is a detail perspective view of one of the folding-sectors. Fig. 9 is a transverse sectional elevation of the preferred form of machine,

showing the upper folding-sector made in sections to permit its ready removal. Fig. 10 is a similar view showing a modification in which some of the partitions are omitted. Fig. 11 is a detail view of the discharge end of the folder, illustrating a slightly-modified construction.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The machine forming the subject of the present invention is designed to interfold strips or ribbons of paper in the manner indicated in Fig. 7, the strips being arranged in the form of a web which is afterward severed in lengths to form sheets of convenient size, the bundles formed by severing the web being placed in suitable holders or casings having a discharge-slot through which single sheets may be successively withdrawn. Paper arranged in this way is convenient for cigarettes, toilet use, and other purposes and is of value for storing and convenient handling of quantities of wrapping-paper. In the folding operation the strips or ribbons are each provided with a central longitudinally-disposed crease or fold, the fold-lines being disposed, respectively, in opposite directions and each strip receiving a leaf of the strips on either side, so that in the finished product the withdrawal of one sheet through the discharge-slot of a holder will result in the partial withdrawal of the next succeeding sheet and its presentation in convenient position to be grasped and withdrawn in turn.

In carrying out the invention I employ a pair of sectors 10 and 11, arranged on convergent lines and formed of either wood or metal. The lower sector 11 is supported in a suitable frame 12, and the upper sector 10 is hung from the frame by supporting-bars 13. The two sectors diverge from each other from the entrance to the discharge end or toward the apex of the machine, being spaced from each other at the entrance end to the extent necessary to permit the free entrance of the strips of paper to be folded, while at the discharge end they are separated from each other a distance approximately equal to one-half of the width of one of the strips. Each of the sectors is provided with partitions, the sector 10 having depending partitions 14 and the sector 11 having vertically-extending partitions 15, all of such partitions

being of the same size and spaced at equal distances from each other, the depending partitions 14 being slightly spaced from the upper surface of the sector 11 and the partitions 15 terminating short of the lower surface of the sector 10. The space between the edge of each partition and the adjacent surface of the sector should not be much, if any, greater than is necessary to permit free passage of the paper, and generally it is found that a space of one-sixteenth of an inch is all that is necessary for practical purposes. At the entrance end of the machine the space between the partition 14 and an adjacent partition 15 is approximately equal to one-half of the width of a strip or ribbon to be folded, while at the discharge end or apex the distance is but little, if any, greater than the thickness of the paper. In practice it is found much better to space the sectors a greater distance from each other at the entrance end of the machine than the distance between each sector and the edges of the partitions of the opposite sector at the discharge end, and while one-sixteenth of an inch is sufficient at the discharge end the space at the entrance end should be about one inch, so that a graduated space may be formed to permit the natural curve of the strips during the folding operation. The wider space at the entrance end of the machine permits the curvature of the strips as they come from the supply-rollers without undue increase in friction on said strip. It is apparent that when the strip is curved transversely by engagement with the partitions at one end and tapers thence toward the flat of the strip at the roller that if the entrance end is of contracted width the curving of the strips would be somewhat interfered with and the friction on the strip would be increased. The paper to be folded is wound on rollers or reels 18, having suitable spindles mounted in racks 19, and at points adjacent to the entrance end of the machine are mounted guide-rollers 20, over the lower of which pass the strips from the lower rolls, while the strips from the upper rolls pass under their guiding-rollers. In actual practice these partitions will terminate short of the apex in order to allow the emergence of the folded strips in the form of a web at the apex, the web being withdrawn by means of a pair of reels 22, adapted to engage with the opposite sides of the web, or in some cases the reels may be omitted and the side walls of one of the sectors continued toward the apex to form a gradually-contracted discharge-passage, as shown in Fig. 11, and any means or mechanism may be employed to withdraw the finished reels.

In manufacturing the machine it is preferred to make the upper sector in a number of sections in order to permit ready removal should it become necessary, especially in the

event of accidental tearing of a strip or the choking of one or more of the passages between the partitions. This construction is illustrated in detail in Fig. 9, wherein the upper sector is shown as formed of a number of sections 10', each carrying a partition. Each section has one or more lugs 24, which may be bolted to a cross-bar 25, and when the latter is unbolted and removed any one or all of the sections 10' may be readily removed. The upper transverse bar 25 is bolted to standards 26, that form part of the frame, and said bar serves to support the several sections in proper position.

In the operation of the mechanism the strips of paper are drawn between the partitions, their central portions being guided by the edges of the partitions and the opposite sides or leaves of each lower strip being turned upward by contact with the sides of the adjoining partitions, while the sides or leaves of each upper strip are turned downward, the leaves gradually interfolding as the apex is approached and finally issuing from the narrowest end of the sectors in the form of a flat web of a thickness depending on the capacity of the machine.

Fig. 9 illustrates the position usually assumed by the paper during the first part of the folding operation, the strips being each curved transversely and the frictional resistance being comparatively small. During the whole operation of folding the strips are so curved transversely that their opposite edges gradually approach each other, the bending being accomplished in a manner somewhat similar to the bending operation as usually carried on by the fingers, where the edges of a strip or sheet to be folded are first brought together and the paper then flattened until the central crease is formed. This permits of a folding of the weakest and flimsiest paper, the folding operation being so gradual that friction is reduced to a minimum.

In some cases the intermediate partitions of the upper sector may be omitted, as shown in Fig. 10, and the edge portions of the upper strips may be relied upon to form the central fold-line in the lower strips. The outer partitions or edge walls are retained in order to properly support the outer strips.

Having thus described the invention, what is claimed is—

1. In a machine for interfolding strips of material, a pair of superposed sectors, each including a body portion, and a plurality of convergent partitions of contracted width, the spaces between said partitions affording passages in which the strips may be curved transversely, and interfolded with each other without frictional contact of the partitions with the entire area of the strips, the body portions of the sectors engaging with the central portions of the strips being folded.

2. In a machine for interfolding a plurality

of strips, a pair of sectors having folding and guiding devices for the outer strips, intermediate strips serving to mutually sustain each other.

5 3. In a paper-folding machine, a pair of sectors having strip folding and guiding members less in number than the number of strips to be folded.

10 4. In a paper-folding machine, a pair of sectors, and partitions carried thereby, the distance between the sectors at the entrance end being greater than the distance between each sector and the edges of the partitions of the opposite sector at the discharge end.

15 5. In a machine for interfolding a plurality of strips, a pair of sectors having edge

plates and intermediate partitions, the edge plates being continued beyond the ends of said partitions to form a contracted discharge-mouth.

20 6. In a paper-folding machine a pair of sectors having paper folding and guiding partitions, one of said sectors being formed of a plurality of longitudinally-extending and transversely-separable sections.

25 In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

ARTHUR E. SEXTON.

Witnesses:

H. H. CLARK,
EMMET H. WILSON.