Oct. 29, 1935. A. IMSHAUG 2,018,855

FOLDING

Filed Nov. 23, 1932

Fig 1

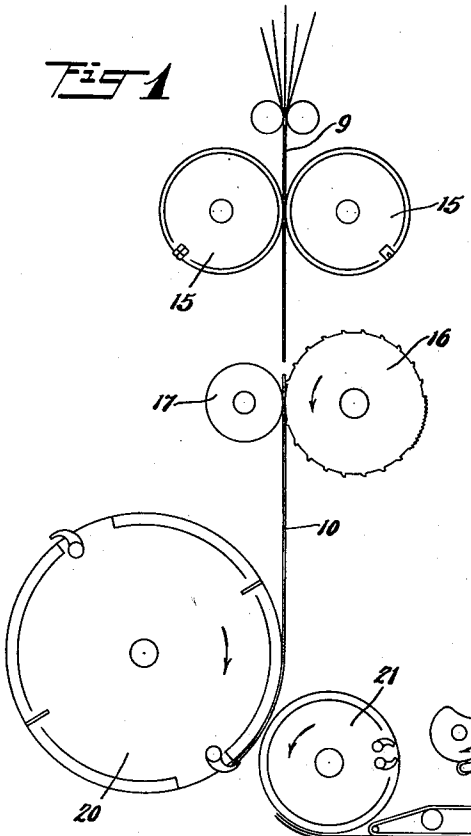
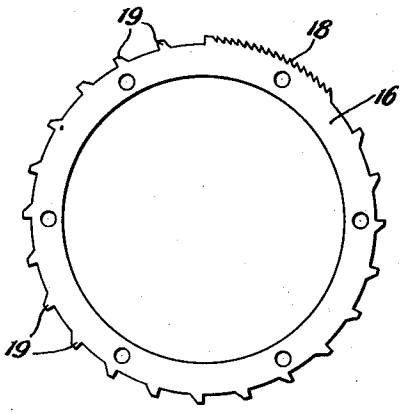


Fig 2



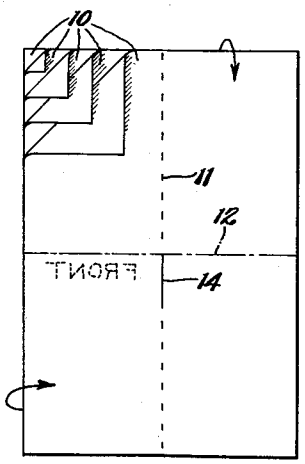


Fig 3

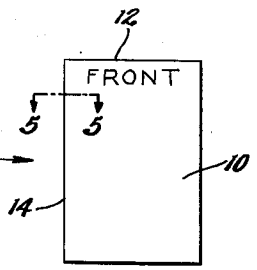
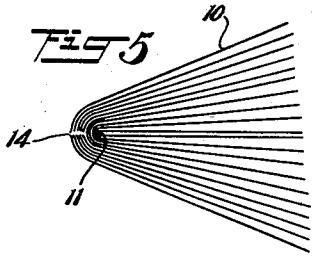


Fig 4

Fig 5



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FOLDING

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4 Claims. (Cl. 270—64)

The present invention relates to folding and more particularly to a new and improved method of folding a group of sheets whereby wrinkling of the sheets at the fold is avoided.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

The invention consists in the novel parts, construction, arrangements, combinations and improvements herein shown and described.

The accompanying drawing, referred to herein and constituting a part hereof, illustrates one embodiment of the invention, and together with the description, serves to explain the principles of the invention.

Of the drawing:—

Figure 1 is a diagrammatic view of a folding mechanism suitable for use in producing the product of the present invention and for practicing the method of the present invention;

Figure 2 is a detailed front elevation of the slitting disc used in connection with the present invention;

Figure 3 is a diagrammatic plan view of a group of sheets to be folded in accordance with the present invention, with the lines of fold indicated thereon;

Figure 4 is a diagrammatic view of the completed product; and

Figure 5 is a sectional view taken on the line 5—5 of Figure 4.

The present invention has for its object the provision of a novel folded product and method of producing the same whereby wrinkling of the product is prevented. Another object is the provision of such a product and method whereby the folded edges of the product will be of substantially uniform thickness throughout their length. Still another object is the provision of a novel method of folding which permits a larger number of sheets to be satisfactorily folded than has heretofore been possible.

Referring now in detail to the accompanying drawing, which shows an illustrative product in accordance with the present invention and the steps of the preferred method of producing said product, said product comprises a plurality of sheets 10 of substantially uniform size, associated in register with each other. As indicated in Figure 3, said sheets are to be folded along a central longitudinal line 11 and are also to be folded along a central transverse line 12 to form the product shown in Figure 4 of the drawing. Other folds may be employed as determined by the size, shape and number of pages desired in the final product.

To prevent wrinkling of the inside pages of the product adjacent to the point where the lines of fold 11 and 12 intersect each other, a short slit 14 is formed in said product, prior to the last folding operation, and said slit preferably extends through all of said sheets, and preferably extends to but not beyond the line of fold 12 at right angles to the last fold. Said slit is also positioned to lie on the outside of the folded product, as shown in Figure 5. While said sheets are folded along the line of last fold 11, the edges of the paper at the slit can move away from each other a slight distance and thereby wrinkling of the sheets on the inside of the product is prevented.

If desired, a line of perforations may be provided along the line of fold 11 to facilitate binding of several products into a single book.

When the slit 14 extends only to fold 12, and the inner half of the product is not slit, this slit does not interfere with proper registration of the products against conveyor stops when said products are gathered together in the bindery.

Figures 1 and 2 of the drawing illustrate a typical mechanism for carrying out the method of the present invention, and as there shown a group of associated webs 9 are cut into sheet lengths by rotary cutting cylinders 15, and said sheets are led to the folding mechanism past slitting and perforating disc 16. The circumference of disc 16 is preferably equal to a sheet length, and cooperates with a backing roll 17 which presses the sheets against the teeth on disc 16 to perforate and slit the sheets. Disc 16 is provided with a series of fine, closely spaced teeth 18, for a distance approximately equal to one-sixth or one-eighth the sheet length, and throughout the remainder of its periphery it is provided with larger teeth 19, spaced farther apart which perforate the product in alinement with the slit 14 formed by teeth 18.

The folding mechanism may be of any desired form, but as shown comprises a folding cylinder 20 which serves to fold the sheets transversely into a folding jaw on jaw cylinder 21 by which they are laid on delivery tapes 22 and conveyed to the chopper folder 23 where they are folded longitudinally along the line of perforations 11 and slit 14.

Disc 16 is driven in timed relation to the fold-

ing mechanism, and is so timed that the slit 14 is properly positioned immediately in advance of the line of fold 12.

Other forms of mechanism may, of course, be employed in carrying out the present invention, and the slit, perforations and the several folds may be formed by hand, if so desired.

The invention in its broader aspects is not limited to the specific mechanism shown and described but departures may be made therefrom within the scope of the accompanying claims without departing from the principles of the invention and without sacrificing its chief advantages.

What I claim is:—

1. The method of preventing wrinkling in the folding of signatures which comprises forming a slit through a plurality of associated sheets and folding said sheets a plurality of times, the last fold being at right angles to another fold with the slit on the outside and along the line of the last fold and extending only to the folded edge of the product.

2. The method of preventing wrinkling in the folding of signatures which comprises forming a slit through a plurality of associated sheets and perforating said sheets along a line extending from both ends of said slit, folding said sheets along a line touching one end of said slit and folding said sheets a second time with the line of fold along said slit and with said slit on the outside of said product.

3. A folded product comprising a plurality of sheets folded a plurality of times with the last fold at right angles to another fold, and a short slit on the outside of the product extending from a folded edge along the line of the last fold, said product also being perforated along the line of said last fold.

4. A folded product comprising a plurality of sheets folded together a plurality of times with the last fold at right angles to another fold, a short slit on the outside of the product along the line of said last fold and extending only to said other folded edge of said product.

ARNOLD IMSHAUG.