Aug. 26, 1930. K. WANDEL 1,774,497

PAPER ARTICLE AND PROCESS OF MANUFACTURE

Filed June 27, 1930

Fig. 1.

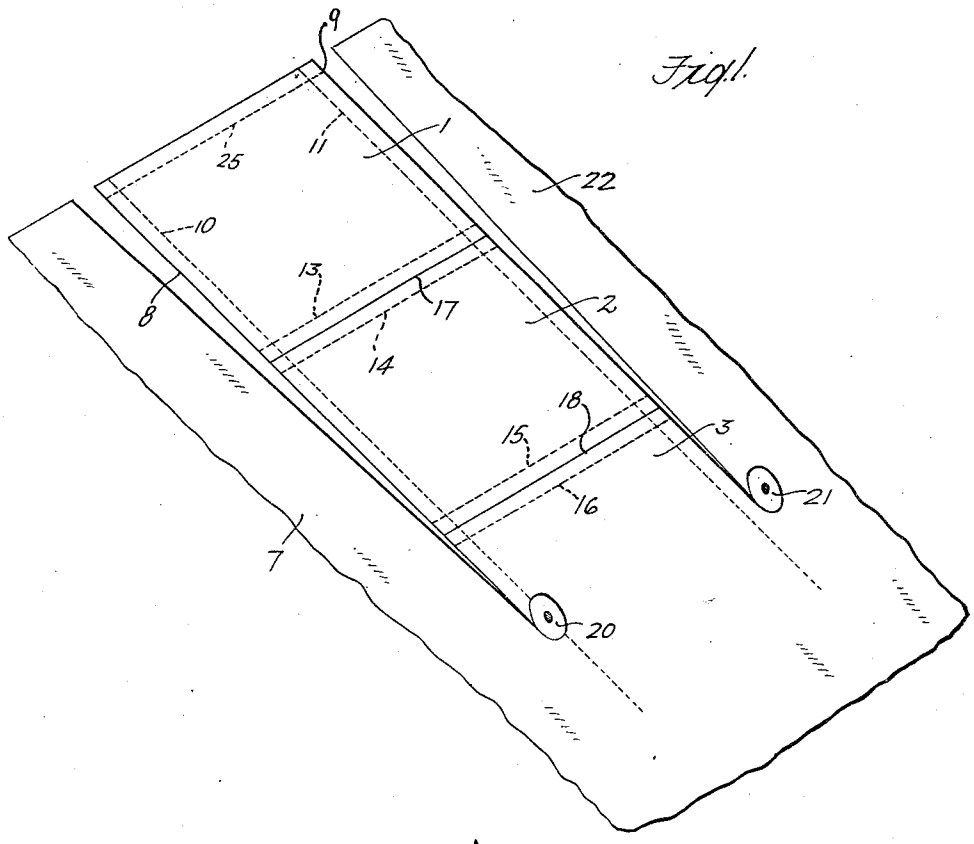


Fig. 2.

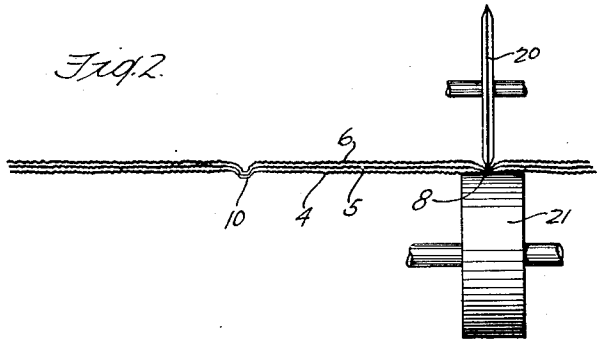
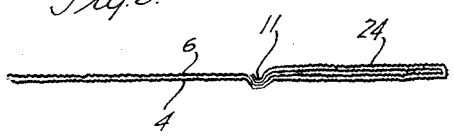


Fig. 3.



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1,774,497

UNITED STATES PATENT OFFICE

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PAPER ARTICLE AND PROCESS OF MANUFACTURE

Application filed June 27, 1930. Serial No. 464,203.

My invention relates to a paper article and its process of manufacture. My object is to improve on constructions heretofore devised.

The invention is particularly adaptable to the manufacture of soft paper handkerchiefs, toweling and the like. Certain features of the invention are also useful in the production of continuous strips of paper which may be readily torn apart to form individual articles such as in office toweling or toilet paper for example.

In a companion application No. 424,112 I have disclosed the manufacture of a soft handkerchief which has the appearance and "feel" of a well laundered fabric handkerchief, by superposing a plurality of sheets of light, flimsey and lightly creped cellulose tissue secured together by heavy pressure in a band of substantial width around the margin, together (if desired) with lines of indentations along the inner margins of said pressed areas to simulate the ordinary hemstitching on a handkerchief. Such a handkerchief is attractive and useful but the manufacture imports some objections which my present invention is designed to avoid. When the margins are pressed by means of pressure rolls the material, on account of its light and flimsy texture, may be somewhat shifted ahead of the rolls and result in undesired wrinkles. This is particularly the case where the material is creped or otherwise embossed over the areas so pressed.

Also in a fabric handkerchief which is hemmed, the double layers of the hemmed margin do not adhere one to the other. One object of my invention is to fasten the several sheets together at the extreme edges so as to seal the edges as well as by a series of indentations somewhat inward from the edges which would not only form an additional fastening or securing means but also simulate the stitching of a hemmed handkerchief, while leaving the areas between the edges and indentations preferably unpressed.

In the drawings which represent one embodiment of my invention—

Fig. 1 is a perspective view of a paper strip of two or more handkerchiefs before they are severed into the individual articles; and

Figs. 2 and 3 show enlarged sectional details which are more or less diagrammatic as it is practically impossible to show accurately in a drawing the exact appearance.

I am aware that my invention may be embodied in various forms, either in continuous strips or in individual articles and these articles may be for various uses. I have however illustrated the manufacture of a handkerchief as one embodiment which may be preferred.

The article is made from a plurality of superposed sheets of extremely thin and flimsy cellulose tissue such as "facial" tissue which is soft and absorbent. Any number of sheets may be used but two or three are usually sufficient, depending upon the use to which the article is to be put. I prefer to manufacture the articles in long strips which are then separated into articles, handkerchiefs or the like. In Fig. 1 I have represented three handkerchiefs 1, 2 and 3 made by superposing three individual sheets, which sheets are indicated in Fig. 2 by 4, 5 and 6. 7 and 22 represent waste portions partially severed from the sides of the strip in such manner as to form the sealed edges 8 and 9.

10 and 11 represent a series of indentations along the strip somewhat inward from the edges, one of which indentations is indicated at 10 in Fig. 2. These secure the sheets together by compression at a series of points as the fibres of one are driven into and more or less interlaced with the fibers of the other, whether or not these indentations actually perforate the sheets.

If it is desired to form handkerchiefs or similar articles, pairs of transverse similar indentations 13, 14 and 15, 16 may be formed at intervals along the strip and the handkerchiefs may be separted by similarly cutting along the lines 17 and 18.

The sheets are fastened together by the lines of indentations, but of nothing else were done the edges 8 and 9 of the sheets would not be fastened together or sealed. I therefore prefer to join the sheets together so as to

seal the edges by what I have termed "line compaction" as distinguished from pressure in a relatively broad band. This line compaction may be accomplished in various ways but in Fig. 2 I have illustrated one method which comprises a cutting wheel 20 which rotates against a steel roller 21. The action of the edge is first to heavily press the sheets in a line and drive the fibres of one into those of the other, thus fastening and sealing the edges. If the pressure is sufficient it will also cut through the sheets, leaving the sheets fastened and sealed at their edges in a clearly defined sharp line.

In Fig. 1 I have indicated the cutting wheels 20, 21 as having partially cut through the sheets to cut off the waste portions 7 and 22 and seal the edges.

If it is desired to divide the strip into individual handkerchiefs, a suitable knife may cut them across the lines 17, 18 thus also sealing those edges in the same manner as the edges 8, 9 are line-compacted and sealed during the cutting operation.

If it is desired to form a roll of toweling for example in a long strip from which sections may be readily torn off the, or some of the, lines of indentations may be omitted excepting for example those indicated at 13 and 15, which would then operate as weakened lines which not only fasten the sheets together but also enable one section readily to be torn off from the strip.

The thin and flimsy sheets are, within the area bounded by the indentations, slightly movable on each other. In order to increase the simulation of the "feel" of a well laundered handkerchief, they are also preferably lightly creped or otherwise embossed throughout as indicated by the wavy lines in Fig. 2.

In a fabric handkerchief which is hemmed, the material at the edge is folded back upon itself and fastened by sewing along the inner edge of the hem. In order to simulate this it may be desirable after the edge has been formed and sealed by cutting as above described, to fold the margin back upon itself and fasten the edge in place by the longitudinal line of indentations. I have indicated this in Fig. 3 in which the marginal portion 24 has been folded back upon itself and the edge secured by the indentation indicated at 11.

I am aware that my invention may be embodied in various articles and forms and I therefore do not limit myself to the particular article or steps set forth in the above description and illustrated in the drawings, as these are merely illustrative of my invention.

What I claim is:

1. A plurality of sheets of thin and flimsy cellulose tissue secured together by a series of indentations running around the article somewhat inward from the edges and by line-compaction along the edges which also seal the edges, the sheets within the series of indentations being free to move on each other.

2. An article as in claim 1 in which at least the exterior sheets are lightly embossed.

3. An article as in claim 1 having the margin folded backward upon itself and secured by said indentations.

4. The process which comprises superposing a plurality of long strips of thin and flimsy cellulose tissue, securing them together by indenting them at each side with a longitudinal series of indentations along the margin somewhat inward from the lateral edges and with pairs of series of indentations across the strip at intervals, and further fastening them together by line compaction at each longitudinal edge and also transversely across the strip between the pairs of transverse indentations mentioned, and dividing the strip into individual articles by separating it along said transverse lines of compaction.

5. A continuous paper strip comprising a plurality of superposed strips of thin and flimsy cellulose tissue fastened together and sealed along each edge by a longitudinal line of compaction, said strip also having at intervals transversely across the same a weakened line which also fastens the individual sheets to one another.

6. The process of forming paper strips which comprises superposing continuous strips of thin and flimsy cellulose tissue, securing and sealing them together along each edge by a longitudinal line of compaction somewhat inward from the edge and removing the waste material along said lines, and forming in the strip at intervals a transverse line of weakness in such manner that the sheets are also fastened together but may readily be separated along said line.

Signed at Shamokin, Pennsylvania, this 14th day of June, 1930.

KURT WANDEL.