Sept. 15, 1925. 1,554,178

A. M. SICKELS

TOILET PAPER

Filed Aug. 16, 1921 2 Sheets-Sheet 1

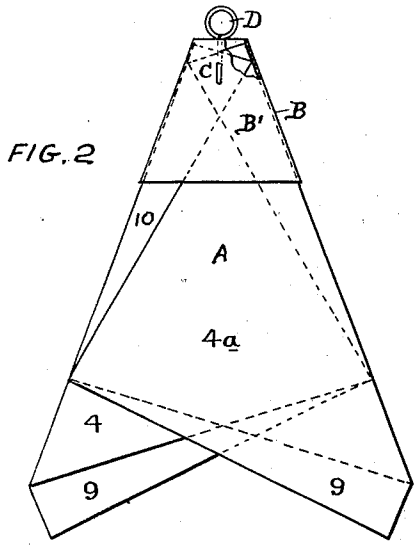


FIG. 2

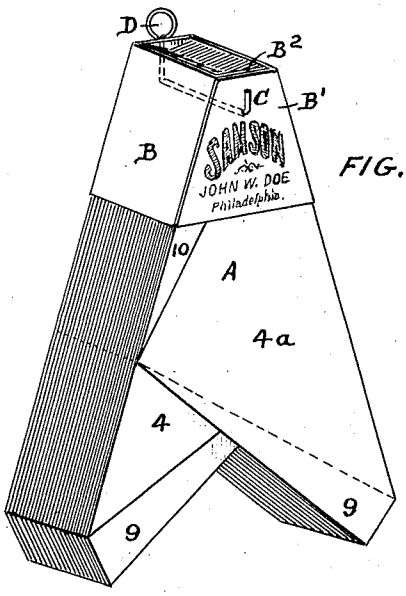


FIG. 1

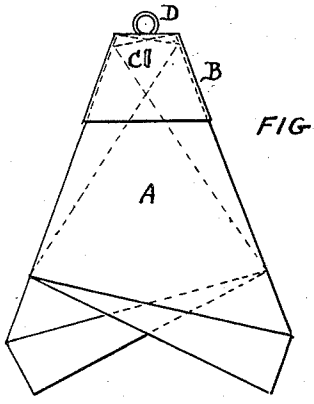


FIG. 2a

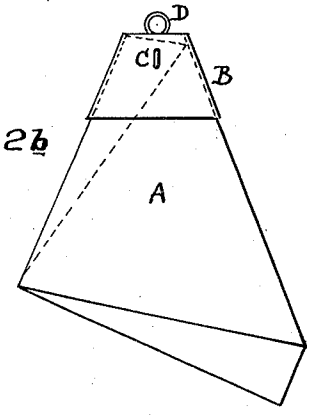


FIG. 2b

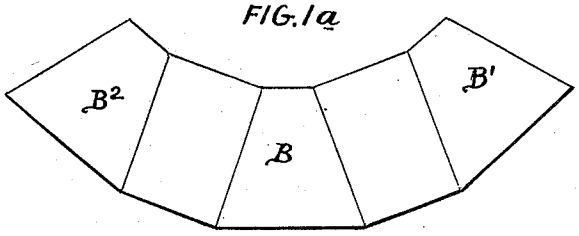


FIG. 1a

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Filed Aug. 16, 1921 2 Sheets-Sheet 2

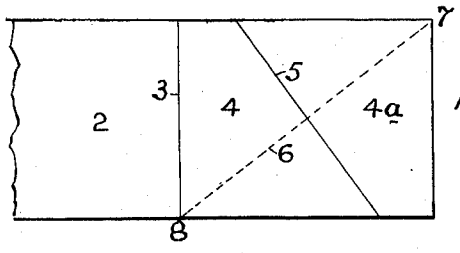


FIG. 3

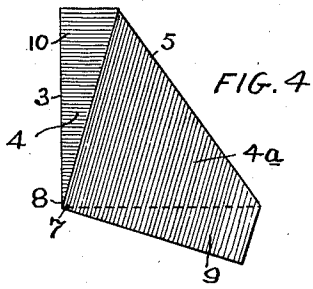


FIG. 4

FIG. 5

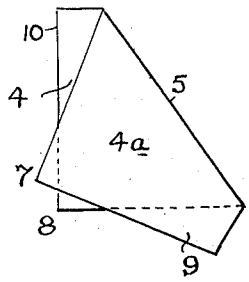


FIG. 6

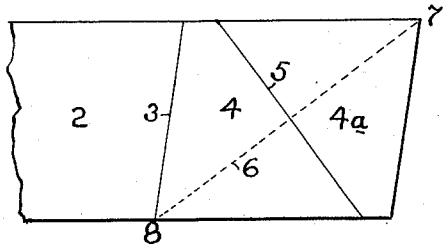
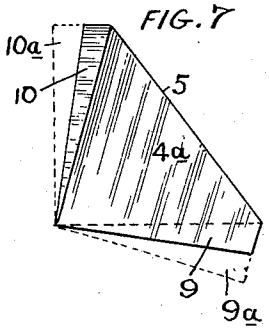


FIG. 7



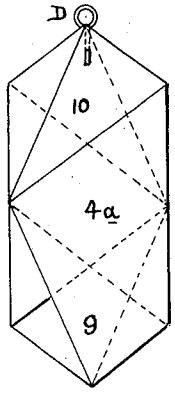


FIG. 8

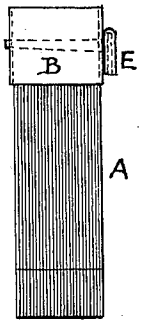


FIG. 9



FIG. 10

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Patented Sept. 15, 1925. 1,554,178

UNITED STATES PATENT OFFICE.

ANNA M. SICKELS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO SCOTT PAPER COMPANY, A CORPORATION OF PENNSYLVANIA.

TOILET PAPER.

Application filed August 16, 1921. Serial No. 492,764.

To all whom it may concern:

Be it known that I, ANNA M. SICKELS, a citizen of the United States, and resident of Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented an Improvement in Toilet Paper, of which the following is a specification.

The object of my invention is to provide a construction of toilet paper which shall embody economy coupled with strength, whereby an inferior paper may be utilized with the effectiveness as to strength of a high priced paper.

In the making of such a paper, there is a relatively small amount of fibre and the relative movement between the water and wire apron or cylinder being rapid, the tendency is to cause the lengths of the fibres to lie in the direction of the length of the web, this being especially so when formed on a woven wire covered cylinder rotating in the vat containing the paper stock in solution. When the paper so formed is dried, the web is weak transversely and readily splits and hence is unsatisfactory. By my invention, I provide a multi-ply sheet formed from a more or less rectangular sheet, preferably longer in one direction than the other, which is folded upon itself, said fold extending on a diagonal line between opposite parallel edges and terminating thereon at a distance from the corners and nearer two of the diagonally opposite corners than as to the other two corners, said fold being made on such an angle that the sheet when folded presents a triangular two-ply body with triangular single-ply extension leaflets respectively extending from the superposed plies to provide additional areas of single ply where the greater strength is not required.

In practice, the triangular multiply sheets of my invention may be stacked into a package and may be wired or stapled and detached one at a time by hand, or associated in a dispensing cabinet whereby they may be discharged one at a time, all as more fully disclosed hereinafter.

My invention will be better understood by reference to the drawing, in which:

Fig. 1 is a perspective view of my improved toilet paper package; Fig. 1ª is a plan view of casing sheet of Fig. 1; Fig. 2 is a front view of the same; Fig. 2ª is a view similar to Fig. 2 slightly modified as to the arrangement of the sheets; Fig. 2ᵇ is a similar view of a further modification; Fig. 3 is a plan view of a paper web and indicating the manner of cutting and folding the sheet; Fig. 4 is a plan view showing the sheet folded to provide a two-ply sheet; Fig. 5 is a plan view showing my improved sheet when folded on a slightly different angle; Fig. 6 is a view corresponding to Fig. 1 but with the web cut on an angle, so that when folded into a two-ply sheet there are smaller auxiliary single-ply portions; Fig. 7 is the sheet shown in Fig. 6 cut off and folded; Fig. 8 illustrates another arrangement of the sheets in forming the package; Fig. 9 is a package of my improved sheets secured together with a metal tongue and socket; and Fig. 10 is an edge view showing my invention adapted for interfolded sheets.

The preferred form of the package suitable for being hung up and the sheets detached one at a time by hand, is shown in Figs. 1 and 2 and comprises the diagonally folded sheets stacked in superposed fan-shaped relation A, said sheets temporarily held together at the upper end by paper casing B and wire staple C having its end looped as at D by which the package may be suspended on a nail or hook. As the general shape of the folded sheets A are triangular and these are arranged one on top of another and alternately oppositely positioned, the package takes a form more or less fan-shaped as indicated and presents the lower single-ply edges 9 in exposed position so as to be easily grasped for detachment. Moreover, as the body portions 4, 4ª are two-ply and the portions 9 are single ply, the latter will be more or less separated so as to permit easy selection of a single sheet at a time. Furthermore, as the folded sheets are oppositely directed, it will be evident that between adjacent single-ply extended portions 9 there will be a four-ply layer, thereby insuring such separation as to permit easy selection of one sheet at a time. By a slight downward pulling of the sheet, it is easily detached from the wire staple C and socket casing B; and it will be observed that as this casing is tapered there can be no resistance therefrom to the withdrawal of the sheet. A convenient manner of making the casing B is shown in Fig. 1ª, which illustrates the stiff paper stamped in a form which, when folded and the two

ends B′, B² overlapped, provides a tapering socket; and the folded shape of the socket is retained and the sheets A secured in said socket by the wire staple C.

I will now refer to the special manner of forming the sheets from the paper web. Assuming that the large or wide paper web from the paper making machine is slit longitudinally into narrow webs 2 with the grain or lengths of the fibre mainly running lengthwise of the web, the said web (Fig. 3) is cut or severed on a transverse line 3 and the sheet so formed folded on a diagonal line 5, the same being preferably at substantially right angles to a line 6, connecting diagonally opposite corners 7 and 8 of the sheet and as in the preferred form, the sheet is rectangular (Fig. 3) or trapezoidal (Fig. 6), longer in one direction than in the other, the diagonal fold 5 will meet the side edges at a distance from the corners as shown. The result of this folding is to provide a two-ply triangular body and projecting triangular single-ply tabs or leaflets 9 and 10, respectively integral with the body parts 4ª and 4, as shown in Figs. 4, 5, 6 and 7, and also in Fig. 2.

The result of this construction is twofold; first it provides the main area of the folded sheet of two-ply and an extended area at each side edge of the triangular body of the single-ply paper integral with the respective body parts, to give a large sheet but with the greatest strength in the middle; and second, the grain or direction of the wood fibres of the paper of the two-plys of the main body portion are crossed either at right angles or approximately so, to provide an additional strength throughout the two-ply body.

As an excessive width of the wide ends of the single-ply extensions 9 and 10 is not necessary, economy in cost of manufacture makes it desirable to reduce the area of these extensions while retaining the large triangular two-ply area of the body parts 4 and 4ª, and this may be done by making the transverse cuts 3 diagonally, as shown in Fig. 6. When this is done and the sheet folded as before described, the modified shape will result as shown in solid lines in Fig. 7, the dotted extensions 9ª and 10ª indicating the extent of the saving in paper. This saving in paper is a matter of very great importance when it is kept in mind that the saving may equal one-tenth or even one-eighth of the whole, based upon the sized sheets of commercial packages now in general use. It is, therefore, evident that with less paper stock, my improved sheet provides a sufficient area and, because of the two-ply crossing grain of the fibre, a greatly increased resistance to tearing or rupture, when compared with the commercial toilet papers in use.

In the forms illustrated in Figs. 1 to 7, inclusive, the points 7 and 8 of the body parts (Figs. 3 and 4) are brought in alinement or juxtaposition so that the two-ply body is in all respects a triangle, but this is not essential, as will be understood by reference to Fig. 5. In this case the angle of the fold 5 is slightly shifted so that the points 7 and 8 are relatively displaced, which has the effect of somewhat widening this area of the completed sheet, as compared to that shown in Figs. 4 and 7. While the triangular form in this case is somewhat modified, nevertheless in a general sense the area will still be approximately triangular, from a practical consideration of the matter.

Aside from arranging the folded sheets in the manner indicated in Figs. 1, 2, 2ª and 2ᵇ, they may be packed alternately in the arrangement shown in Fig. 8. Furthermore, where the sheets are to be dispensed from a cabinet having the usual discharging roller, the casing B may be made with a socket E, Fig. 9; or the usual form of metal staple having a metallic socket at the back may obviously be employed.

Ordinarily, the sheets will be assembled for use in the form of packages, as in the cases above described, but it is manifest that this improved paper may be adapted for various forms of dispensing cabinets which will permit one sheet at a time to be discharged; but as the present invention relates to the sheets and package formed thereof, no detailed description of such dispensing cabinets or devices will be described in the present application. However, it may be stated that in such use the sheets may be stacked as shown in Fig. 2ᵇ, but without the use of the socket case B and staple C, that is to say, all of the folded edges 3 would be arranged at the same side. While the sheets formed from the continuous web may be stacked in package form as previously described, where economy is desired, the severance and creasing or folding lines 3 and 5 may be formed in the web and a portion thereof severed and folded by hand as it is successively removed from the continuous web.

A still further mode of use of my improved sheets is indicated in Fig. 10, which represents the sheets arranged alternately in interfolded relation; that is, the plies of any sheet is interfolded with plies of two adjacent sheets, permitting its use in certain forms of dispensing devices in general use.

It will now be apparent that I have devised a novel and useful construction which embodies the features of advantage enumerated as desirable, and while I have in the present instance shown and described the preferred embodiment thereof which has been found in practice to give satisfactory

and reliable results, it is to be understood that I do not restrict myself to the details, as the same are susceptible of modification in various particulars without departing from the spirit or scope of the invention.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. A sheet of paper in the form of a parallelogram having greater length than width folded on a diagonal line to provide a two-ply body of general triangular shape, the diagonal fold extending between two opposite parallel side edges and terminating at a distance from the other two parallel edges of the sheet, so that the respective triangular parts are of the same area and in folded relation constitutes a two-ply body, said body parts provided at opposite edges with an extended sheet portion which in the two-ply structure furnish single ply triangular leaflets extending in opposite directions beyond the triangular two-ply body portion.

2. A toilet paper sheet comprising a sheet in the form of a parallelogram folded on a diagonal line between two of its parallel sides and providing a two-ply body structure, each ply of which is an irregular polygon in outline and the two plies so relatively displaced that each extends laterally beyond the other at one of its sides to provide oppositely directed triangular single ply leaflets, said leaflets respectively arranged at opposite edges of the two-plies of the body portion.

3. Toilet paper, comprising a sheet in web form with substantially parallel opposite sides folded on a line extending diagonally between two of its parallel sides and providing generally triangular superposed body plies in which the general length of the fiber of the two plies cross each other to provide increased strength at that portion constituting the two-ply body of triangular form, and in which further, the body plies provide extended single ply leaflets of general triangular form, said leaflets respectively arranged as extensions of the two plies at opposite side edges of the respective plies of the body and with their more pointed ends adjacent to the pointed ends of the two-ply body part.

4. A plurality of similarly formed sheets placed one upon the other, said sheets each comprising a web of paper folded diagonally in multiply form with overlapping layers of same areas, each layer being positioned relatively to the other layer so that the paper adjacent to one of its edges extends beyond the multiply portions of the two layers, said extended portions being of triangular form and single ply, and said sheets united at their single ply ends into a unitary package, and wherein the means for uniting the sheets into a package comprises a tapering case about the smaller end of the folded body portions and one set of the leaflets, and a staple extending through the walls of the case and the superposed leaflets, forming a fan-shaped package.

5. The invention according to claim 3, wherein the plurality of folded sheets are stacked with their folded edges arranged alternately at opposite sides of the package and presenting two sets of pointed edges at the end of the package most distant from the united ends of the sheets.

6. A plurality of similarly formed sheets placed one upon the other, said sheets each comprising a web of paper folded diagonally in multiply form with overlapping layers of same areas, each layer being positioned relatively to the other layer so that the paper adjacent to one of its edges extends beyond the multiply portions of the two layers, said extended portions being of triangular form and single ply, the plurrality of folded sheets being stacked with their folded edges arranged alternately at opposite sides of the package and presenting one upwardly tapered set of united sheets and two downwardly extending sets of pointed edges at a distance apart, and wherein the united tapering ends of the sheets are surrounded by a tapered case attached thereto by a staple extending through the case and sheets.

7. A web of paper folded diagonally in multiply form with overlapping layers of same areas, each layer being positioned relatively to the other layer so that the paper adjacent to one of its edges extends beyond the multiply portions of the two layers, said extended portions being of triangular form.

8. A web of toilet paper having lines for folding and for severance formed in a diagonal arrangement to the length of the web wherein every alternate line for folding or for severance is parallel in two series and the successive lines for both folding and for severance are arranged with their obliquities in opposite direction, and in which furthermore, the obliquities of the two series of lines for folding and for severance are formed at a different angle across the web, whereby when one portion of the web is folded upon the adjacent portion the main overlapping parts of the folded paper web is two-ply and the remaining projecting overlapping portions constitute single ply leaflets forming extensions respectively in opposite direction from the folded two-ply layers.

In testimony of which invention, I hereunto set my hand.

ANNA M. SICKELS.