My invention relates to package-forming materials, wrappers, bags, and the like, and particularly to articles of this character to the may be torn limited or predetermined distances only.

Packages, wrappers, bags, and similar articles made of paper, regenerated cellulose, and cellulose acetate, and similar materials are readily torn, even when subjected to the usual treatment which may be torn limited or predetermined distances only. Very often bags and wrappers are formed with a serrated edge in order to simplify severing of the material from which the bag or wrapper is formed from the continuous web of the material. Each of these serrations presents a potential point of tear, and in use of such materials, it is not infrequent for the bag or wrapper to have a small and unnoticeable tear which greatly reduces the strength of the article, and results in very ready tearing when the bag or wrapper is used. For this reason there is considerable loss in unused wrappers and bags, and this condition is particularly troublesome in the case of wrappers and the like formed of regenerated cellulose and materials having similar tearing characteristics, for the reason that when one torn these materials continue to tear without substantial resistance or limitation. Furthermore, packages frequently are formed with the intention that the wrapper shall be torn away only at the top or corner in order that a portion of the contents may be removed or poured out of the wrapper, while the remainder of the package and contents remain intact. This is practically impossible in packages formed of regenerated cellulose and the like, for the reason that bags or wrappers formed of this material, when torn, are wholly destroyed due to the tearing of the material.

Numerous attempts have been made to prevent the tearing of bags, wrappers and the like by providing a fold at the edge of the material or by applying some tear-resisting means to the wrapper, but these arrangements have been designed to prevent any tearing of the materials whatever and render it difficult to open packages or bags to which they are applied. Packages with tear strips or folds for use in opening the package are also known and exist. These folds have also been provided to permit stretching of the wrapper. However, so far as I am aware no one heretofore has formed a wrapper, bag, or package of material so constructed that it may be readily torn to open the package, but which cannot be torn beyond certain predetermined limits, or in which tearing of the material is so directed that the wrapper may be torn away in opening the package with the tear confined to a predetermined definite area. It also appears to be new to provide tear-limiting means in a wrapper at a point spaced from the edge thereof.

I have found that these results can be attained very easily without the difficulty of any attachment of extraneous means to the wrapper or bag, or by the provision of a separate tearing portion on the wrapper, by forming a fold in the material of which the wrapper is made and holding or securing the fold closely adjacent the face of the material to be torn. The fold preferably faces in the direction from which the material is to be torn so that the tear on reaching the fold is prevented from continuing on in that direction and can extend only along the edge of the fold. The fold offers resistance to tearing of the material and therefore acts just as a ruler laid on a piece of paper to cause the tear to extend along the fold, thus forming a straight smooth edge on the opened package or torn wrapper. The package or bag when opened, therefore, has a neat appearance and the contents may be poured therefrom with the same ease as from the opened, but untorn package or rigid container. Furthermore, the wrapper is not destroyed or rendered useless by any small tears that may occur in the top or edge of the material. The wrapper will remain intact about the body of the package when the top thereof is opened or torn away even though the material of which the wrapper is formed is regenerated cellulose or other material which tends to tear in an unrestricted manner.

One of the objects of my invention is to prevent tearing of wrappers, packages, and the like beyond predetermined limits.

Another object of my invention is to reduce losses occurring in the tearing of bags and wrappers in filling and employing the same.

A further object of my invention is to provide a package, wrapper, or the like which, when torn, presents a smooth straight edge.

Another object of my invention is to provide a wrapper formed of regenerated cellulose, or material having similar tearing characteristics, which can be torn to a predetermined and limited extent without destroying the package itself.

A further object of my invention is to provide a package wrapper or the like having a fold formed therein which serves to prevent tearing of the wrapper beyond the fold.

These and other objects and features of my invention will appear from the following description thereof in which reference is made to the
accompanying drawing illustrating typical embodiments thereof.

In the drawing:

Fig. 1 is a perspective of a wrapper embodying my invention, indicating one manner of forming a fold in the material;

Fig. 2 is a sectional view taken on line 2–2 of Fig. 1, with one edge of the fold secured to the sheet;

Fig. 3 is similar to Fig. 2, but shows a construction in which both edges of the fold are secured to the sheet;

Fig. 4 is a perspective of a bag embodying my invention, with a portion of the bag torn to illustrate the action of the fold;

Figs. 5, 6, and 7 are illustrations of alternative forms of folds and constructions embodying my invention;

Fig. 8 is a perspective of an alternative form of wrapper; and

Fig. 9 is a perspective of the wrapper shown in Fig. 8 as applied to a package.

In that form of my invention shown by way of illustration in Figs. 1 and 2 of the drawing, a sheet of material 2 is provided with a fold 4 spaced from an edge 6 of the sheet and extending substantially parallel to said edge 6. The fold 4 is N-shaped and presents an edge 8 on the upper surface of the sheet facing in the direction of the edge 6 of the sheet and an edge 10 on the lower surface of the sheet facing in the opposite direction. As shown in Fig. 2, the edge 8 is held closely adjacent the face of the sheet 2 by adhesive material 12 or is otherwise treated to secure the fold permanently in place. The upper surface of the sheet shown in Fig. 1 is intended to be the outside of the wrapper or package and when formed into a bag as shown in Fig. 4, the edge 8 faces the top of the bag and the edge 6 as shown. With this construction the material may be torn downward from the edge 6 at the top of the bag to the edge 6 of the fold. The fold then prevents tearing of the bag or wrapper further downward and the tear then extends along the folded edge 8 providing a smooth straight tear.

The construction shown in Fig. 3 is similar to that shown in Figs. 1 and 2 but shows both of the edges 8 and 10 of the fold permanently secured to the sheet, the edge 8 being on the outside of the package and the edge 10 on the inside thereof. If a tear should start from a puncture or weak place in the bag or wrapper the edge 10 will prevent tearing of the material upward to the top of the bag while edge 8 prevents tearing down from the top of the bag downward beyond the fold.

Since tearing of the bag or wrapper in opening a package at the top is usually outward, that is away from the package contents, I prefer that the edge 8 of the fold should lie on the outer surface of the bag and be held closely against the same. While the fold preferably is held in place by an adhesive it may be secured in place or held in any other way. When using certain types of material the fold may be welded into place by the application of heat and pressure instead of using an adhesive material. In Fig. 6 I have shown a construction having a deep fold so that when applied to a package the fold is held in place by the package contents themselves, no adhesive being needed. The material within the package pressing against the fold effectively prevents the fold from coming out so that the edge of the fold is held in position closely adjacent the face of the wrapper at all times after application.

In Fig. 5 I have illustrated an alternative construction in which the material is given a double fold. In this form of my invention no adhesive is needed for the reason that the fold does not readily come out even when it is very narrow and subjected to considerable tearing force. The material in this case seems to bind itself tightly together so that the act of tearing the material brings the edge 8 of the fold more closely against the sheet of material and therefore tearing beyond the fold is prevented. In any of the forms of my invention the width and location of the fold or pleat employed may be varied considerably depending upon the particular needs of the user.

By placing the fold near the top or edge of the wrapper small tears commonly starting at the edge of the material or the top of a bag are prevented from destroying the wrapper so that losses and difficulties presented in packaging and filling operations are avoided. Similarly, if the folds may be placed about or near the corners of the wrapper or bag or elsewhere as desired so that the occurrence of a tear at points of particular strain will cause the whole package to be destroyed. Although the provision of a double fold in the material is usually sufficient for most purposes a number of folds may be employed in desired locations to limit any tears in the wrapper that may start at corners or at points spaced from the edge of the bag or wrapper, so that the life and durability of the article is considerably increased.

In the construction shown in Fig. 7 of the drawing, the bag or wrapper is provided with a fold 16 at the edge of the wrapper 18. The fold 16 is preferably in the form of a single turned edge beyond which the extension 20 of the wrapper extends to provide a free end for wrapping about the top of the package. The extension preferably extends below the fold 16 and engages the wrapper at 22 so that the extension is carried by the wrapper rather than by the fold. The extension may be formed of the same material as the wrapper or of any other suitable material so that when torn the extension 20 will tear comparatively with the fold 16 until the tear reaches the edge of the fold 16. The tear will then extend along the edge of the fold as in the previous forms of my invention. In this construction the fold 16 is preferably secured frictionally to the extension 20 with the extension on the inner face of the wrapper. In this way I provide a reinforced edge to the material which insures a durable construction even after the package is opened.

The wrapper shown in Figs. 8 and 9 is provided with two oppositely facing folds 24 and 26 which are preferably secured permanently to the face of the end portions 28 and 30 respectively. When applied to a package or to the material to be wrapped the folds 24 and 26 are brought into alignment so that they form in effect a continuous fold extending about the package at a predetermined distance from the top thereof. The end portion 30 may be longer than the portion 28 so that the top of the package may be folded to provide a free opening tab 32 which may be grasped to open the package and start a tear in the material.

While I have herein shown and described certain preferred embodiments of my invention and their particular application to bags and wrappers formed of materials such as regenerated cellu-
2,053,116

lose, paper and the like, it should be understood that the foregoing is intended to illustrate my invention and is not intended to limit the scope thereof.

5 What I claim is:

1. A bag formed of a sheet of material having a fold therein spaced from the top of the bag with the fold on the outside of the bag facing the top thereof and secured against the face of the bag.

10 A package wrapper formed of material having the tearing characteristics of regenerated cellulose and designed to be torn in opening the package, said wrapper having a fold formed in the material of which the wrapper is made and located on the outside of the wrapper with the edge of the fold secured against the surface of the material and facing in the direction from which the material is to be torn when the package is opened to prevent tearing of the wrapper beyond said fold.

15 3. A wrapper formed of a sheet of material having the tearing characteristics of regenerated cellulose, said wrapper having a fold therein spaced from an edge of the sheet and substantially parallel thereto, said fold being permanently secured to the sheet to prevent tearing thereof beyond said fold.

20 4. A package having a wrapper thereon formed of material which is readily torn, said material having a fold therein located near the top of the package with an edge of the fold on the outside of the package facing the top thereof and secured against the face of the material to prevent tearing of the material beyond said fold.

25 5. A package having a wrapper thereon formed of material having the tearing characteristics of regenerated cellulose, said material having a fold therein located near the top of the package with an edge of the fold on the outside of the package facing the top thereof and permanently secured to the face of the material to prevent tearing of the material beyond said fold.

30 6. A wrapper formed of a single sheet of regenerated cellulose formed with an N-shaped fold spaced from an edge of the sheet and parallel thereto with the edge of the fold facing said edge of the sheet and located on that face of the wrapper intended to be placed on the outside of a package when the wrapper is in use, the fold being permanently secured to the face of the sheet so that when the wrapper is torn from the edge of the sheet toward the fold the edge of the fold serves to prevent tearing of the material beyond the fold and causes the tear to extend along the fold producing a smooth straight edge to the torn wrapper.

35 7. A bag formed of a single sheet of material having the tearing characteristics of regenerated cellulose with a fold formed in the material extending about the bag near the top thereof with the edge of the fold on the outside of the bag permanently secured to the bag and facing the top thereof to prevent tearing of the bag downward from the top below the fold.

40 8. A wrapper formed of a single sheet of material having oppositely facing folds formed in the material and extending substantially parallel to opposite ends of the sheet with the edges of the folds permanently secured to the same face of the sheet.

45 9. A package having a wrapper extending about the front bottom and back of the package with the edges of the wrapper overlapping at the sides of the package, said wrapper having folds formed therein and located adjacent the top of the package in substantial alignment with the edges of the folds on the outside of the wrapper facing the top of the package and permanently secured to the face of the wrapper.

50 10. A sheet of material formed entirely of regenerated cellulose having a flat fold formed therein and lying closely adjacent the face of the sheet serving to limit or control the amount and character of tears that may be produced in the sheet.

55 11. As an article of manufacture, a commodity bag formed of a non-fibrous sheet material having means to limit the tearing thereof, said means comprising a pleat positioned adjacent the open end and transverse the length of the bag, the folds of the pleat being held together by a suitable adhesive.

ALBERT SPERRY.