July 24, 1923.

1,462,995

W. L. WRIGHT

CLOSURE DISK

Filed April 15, 1922

Fig. 1.

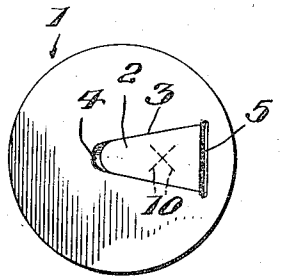


Fig. 2.

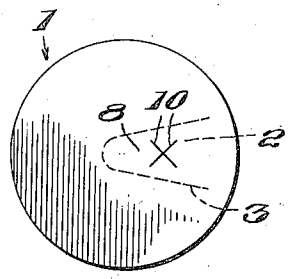


Fig. 4.

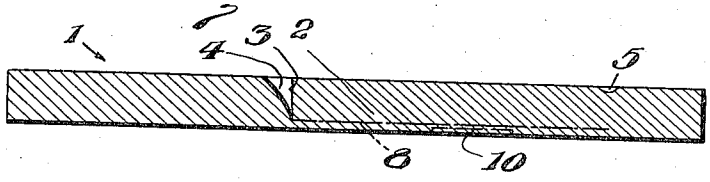
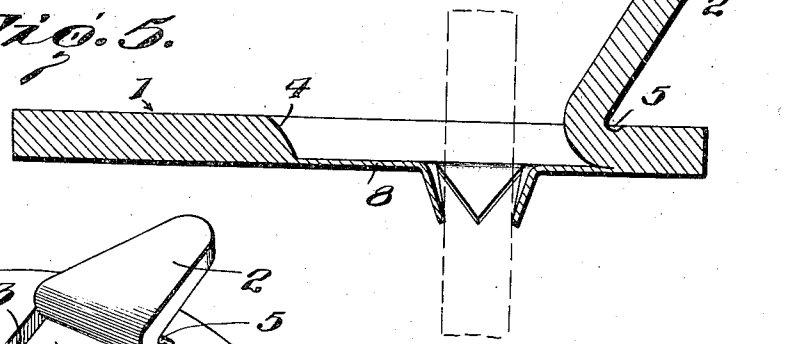


Fig. 5.



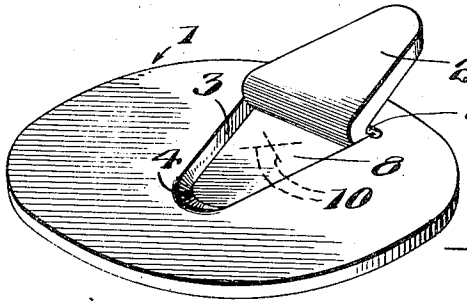


Fig. 3.

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Patented July 24, 1923. 1,462,995

UNITED STATES PATENT OFFICE.

WILBUR L. WRIGHT, OF FULTON, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO OSWEGO FALLS CORPORATION, OF FULTON, NEW YORK, A CORPORATION OF NEW YORK.

CLOSURE DISK.

Application filed April 15, 1922. Serial No. 552,990.

To all whom it may concern:

Be it known that I, WILBUR L. WRIGHT, a citizen of the United States of America, and resident of Fulton, county of Oswego, State of New York, have invented certain new and useful Improvements in and Relating to Closure Disks, of which the following is a specification.

This invention relates to certain improvements in closure disks for bottles and other containers; and the objects and nature of the invention will be readily understood by those skilled in the art in the light of the following explanations of the accompanying drawings illustrating what I now believe to be the preferred mechanical expression or embodiment of the invention from among other forms, and constructions within the spirit and scope thereof.

An object of the invention is to provide a one-piece paper material closure disk that can be rapidly and economically produced in quantities and that will embody an integral portion capable of performing the functions of a pull or extracting tab and arranged over and normally covering a thin portion of the disk so formed as to permit the passage of a suction straw or tube therethrough, when the tab is elevated, through which the bottle contents can be partially or entirely withdrawn without removal of the disk from its position otherwise sealing the bottle mouth, and furthermore to so cut and form the disk during the process of making the same, as to provide a portion of the disk to form said tab in thickness but slightly less than the full thickness of the disk itself and capable of being bent up to expose a thin wall in thickness equal to but a slight fraction of the full thickness of the disk, and thus to provide a portion that can successfully perform disk extracting functions without the necessity of added bracing elements to prevent the tab base separating or tearing from the disk when the tab is subjected to disk extracting pull.

With these and other objects in view my invention consists in certain novel features in construction and in formations and features more fully and particularly set forth and specified hereinafter.

Referring to the accompanying drawings:

Fig. 1 is a top plan of a closure disk embodying my invention:

Fig. 2 is a bottom plan thereof:

Fig. 3 is a perspective view showing the pull tab bent up to approximately extracting position:

Fig. 4 is a sectional view on an enlarged scale.

Fig. 5 shows the disk on an enlarged scale, in vertical section with the pull tab elevated and a drinking straw shown by dotted lines extending through the weakened part of the relatively thin floor normally covered by the tab.

Closure disks of this type are cut or punched from sheets or webs of so-called "board" or paper material composed of pulp or other fibrous material, which is more or less hard, stiff and resilient. This board as a finished product is single ply although in the process of manufacture several plies or layers of pulp may be brought together to form the board. This board possesses the peculiar characteristics of more or less easily splitting into layers horizontally or in planes parallel with its hard top and bottom faces. This fact has been taken advantage of in forming closure disks with pull tabs consisting of a tongue like portion of the top surface of the disk cut and split from the disk and in thickness usually slightly less than half the thickness of the disk, as it was heretofore believed that it was necessary to make the tongues very thin in order to separate them from the disk body and not to weaken the disk. These thin tongues, however, would tear and separate from the disks under disk extracting strain even when staples were introduced in an effort to limit the splitting action and to brace the connection between tongue and disk against tearing.

I have discovered, that the disks can be successfully made and used with tongues that in thickness are but slightly less than the full thickness of the disk, and I utilize this discovery in providing the disk with a very thin wall portion that is sufficient to support and uphold the tongue against being pressed down through the disk under

normal conditions, and that provides for the passage of straws or tubes through which the contents of a bottle sealed by the disk can be sucked, and that also provides such junction between the up swung pull tab or tongue and the disk body as to withstand disk extracting pull and thereby render unnecessary the use of staples heretofore found to be necessary.

In the particular example illustrated by the drawings, I show a stiff more or less resilient single-ply one-piece paper material closure disk 1, cut from, say, so-called "forty point board," i. e., stock approximately forty thousands of an inch in thickness (although of course, I do not wish to so limit my invention).

A pull tab or tongue-like portion 2 arranged approximately radially of the disk is outlined on the top surface of the disk by a vertical cut 3 extending down through the major portion of the thickness of the disk but stopping short of the bottom surface of the disk. For instance, with a "forty-point" disk, the vertical depth of the cut 3 would be approximately thirty five points. The cut 3 is so formed that the tongue or tab will extend inwardly toward the central portion of the disk with the base of the tongue where the tongue joins or merges into the disk, located approximately near the outer edge portion of the disk. I do not however, wish to limit my invention to such particular arrangement of the tongue or tab.

The material of the disk is depressed or otherwise removed at the top surface of the disk to form a depression or recess 4 at the inner or free end of the tongue or tab, to render the free end of the disk conveniently accessible for the purpose of elevating the same to upright or pull tab position during which elevating movement the material of the cap will horizontally split approximately along the horizontal plane in which the vertical tab forming cut 3 terminates. The thickness of the tab or tongue will hence be approximately equal to the vertical depth of the cut 3.

The disks can be manufactured and placed on the market with the pull tab defined or outlined by the cut 3 but still connected at its bottom into the disk, not split from the disk. The disks will thus be inserted in the bottle mouths and the tab will be elevated by inserting the finger nail in recess 4 to engage and start the initial elevation of the free end of the tab to the extent necessary to enable the fingers to grasp the elevated free end of the tab and pull the same upwardly to complete the separation of the tab down to its base and complete upward swing of the tab on bending line 5. The bending line can be established by vertically depressing the disk by suitable means applied to the disk top along line 5 approximately connecting the separated ends of the cut 3 and arranged transversely of the axis of the tab and defining the tab base or the junction of the tab with the body of the disk. This depression of the disk, also, tends to prevent tearing and causes the tab to bend at the desired line. Instead of puting the disk on the market with the underside of the tab joined throughout its length into the disk for subsequent splitting therefrom, the disk can be put on the market with the tab partially released at its under side or the splitting operation can be started or initiated at the free end of the tab during the process of manufacture, by the upward blow of a bumper against the under side of the disk below the free end portion of the tab. However, when put on the market, the free end of the disk is not elevated above the plane of the top surface of the disk and hence does not interfere with the use of the disks in capping machines.

Considerable pulling force is exerted on the upstanding tab to extract the cap from the bottle mouth sealed thereby, and under such pulling strain, the relatively very thin tabs of the prior art would often tear off at the junction with the disk and required the application of staples to prevent splitting of the disk through to its edge in continuation of the tab.

I have discovered that, if the thickness of the tab almost equals that of the disk, the tab possesses sufficient tensile strength to sustain the disk extracting pull without tearing or separation and that the thickness of the disk above the plane in which cut 3 terminates, is sufficient to resist tearing in continuation of the ends of cut 3 toward the disk edge and hence avoids the necessity of employing staples or other reinforcing devices heretofore applied to the disk at the base of the tab.

By thus forming a tab that in thickness almost equals the thickness of the disk, I provide a thin wall or floor 8 for the recess or depression occupied by the tab and exposed when the tab is elevated, and this wall is of sufficient strength to support and uphold the tab when in normal lowered position and to prevent depression of the tab down through the disk. This thin bottom wall also enables me to provide for the passage of sucking straws or tubes into the bottle sealed by the disk, after the pull tab has been elevated, and without removing the disk. There is considerable demand for a disk possessing this characteristic for use in the consumption of milk, and various soft drinks, sold for consumption from the bottle, particularly where the contents of the bottle should be protected by the disk during consumption, and where it is desired to again close and seal the disk while in the bottle mouth after the straw or tube has been

withdrawn. There is also demand for a one-piece pull-tab disk that will permit the passage of a straw therethrough, but that also will seal and close the bottle mouth when the tab is elevated and the contents are not to be consumed through a straw, i. e. for ordinary mouth cap or closure disk purposes.

The thin wall or floor 8 (say only "five points" in thickness) can be variously formed and treated to provide for the small straw or tube opening which will admit air as well as the tube or straw and that will be covered by the tab when pressed down into the recess and onto said floor. So far as the present invention is concerned, I prefer to have this thin wall or floor normally imperforate. For instance, in the drawings, I show the under side of the cap at about the bottom face of the thin wall 8 scored or indented by meeting converging lines 10 without perforating or cutting through the floor to form the floor with a weak area intermediate the length and width of the floor that will easily respond to the pressure of a straw or tube end on the top surface of the floor, by breaking through and permitting passage of the tube or straw and providing a hole of sufficient area to receive the tube and permit air leakage into the bottle as the contents are withdrawn. The weakened area can be formed by any suitable scoring or the like, applied to the bottom surface of the cap during the process of manufacture, or the wall can be otherwise cut or formed for the passage of the tube, without forming what is known as a pouring opening, and which will not weaken the cap and which can be closed by pressing down the pull tab.

What I claim is:

1. A one-piece pull-tab paper-material closure disk having a vertical cut extending down throughout the major portion of the thickness of the disk but stopping short of its bottom surface to form a very thin bottom wall below the cut, said paper material readily splitting in planes parallel with its upper and lower surfaces, said cut outlining a pull tab, said very thin wall forming the floor of the recess normally occupied by the pull tab and being formed for the passage of a suction tube intermediate the length and width of the floor when said tab is elevated.

2. A one-piece pull-tab closure disk composed entirely of paper material capable of splitting in planes approximately parallel with its faces, said disk having a pull tab outlined in its top surface by a vertical cut extending downwardly through the major portion of the thickness of the disk to provide a thin wall below the tab and forming the floor of the recess normally occupied by the tab and having an intermediate portion formed for the ready passage of a suction tube when the tab is elevated and adapted to be covered by the tab when again pressed down to normal position.

3. A one-piece pull-tab closure disk composed of paper material capable of readily splitting longitudinally, said disk having a pull tab of substantial thickness outlined in its top face by a vertical cut, said cut providing a thin wall forming the floor of the recess normally occupied by the tab, said floor being normally imperforate and having an intermediate portion weakened by lines at the under face of the disk to provide for the easy passage of a suction tube.

4. A one-piece pull-tab closure disk composed entirely of paper material capable of splitting in planes approximately parallel with its faces, said disk having a pull tab outlined in its top surface by a vertical cut extending downwardly through the major portion of the thickness of the disk to provide a thin wall below the tab and forming the floor of the recess normally occupied by the tab, the thickness of said tab being but slightly less than the thickness of the disk, whereby the necessity of bracing the tab and disk by a staple is avoided.

5. As an article of manufacture, a paper-material closure disk formed to provide for the top exposure of an intermediate normally-sealed and covered area embodying a portion formed when uncovered to permit passage of a drinking tube, said disk being imperforate against passage of liquid and adapted for use in capping machinery, and having a top tab part overlying said area, and at one end joined to the disk against complete detachment therefrom under disk extracting pull and adapted to be swung up and expose said area and form a disk extracting pull handle.

6. As an article of manufacture, a paper material closure disk formed to provide for the top exposure of a normally-sealed covered relatively-thin depressed floor embodying a weakened part to permit passage of a drinking tube when the floor is exposed at the top, said disk being imperforate against passage of liquid and having a depressed top tab overlying said floor and adapted to be bent up to expose said floor and form a disk extracting pull handle capable of being bent down to again cover the floor.

7. As an article of manufacture, a paper material closure disk formed to provide for the top exposure of a normally-sealed covered floor embodying a weakened part to permit passage of a drinking tube when the floor is exposed at the top, said disk being imperforate against passage of liquid and having a depressed top tab overlying said floor and adapted to be bent up to expose said floor and form a disk extracting pull handle capable of being bent down to again cover the floor.

WILBUR L. WRIGHT.