This invention relates to closure means for cartons, and more specifically, to an improved closure which may be formed integrally with or attached to a carton of the type commonly used for packaging breakfast cereals, powdered detergents, soap flakes, sugar and other dry and finally-divided materials so that such materials may be poured therefrom.

The conventional cardboard boxes or cartons for dispensing dry granulated or powdered materials are usually provided adjacent one corner thereof with a scored or perforated line extending about an area which may be depressed to form a discharge opening. However, housewives often encounter difficulty in breaking the wall of the carton along the perforation or score line with the result that the opening may be larger than desired and may make it inconvenient or difficult to pour the contents from the container. Furthermore, such cartons are seldom provided with means for closing the discharge opening after the carton has been opened. Consequently, a food product packaged within the carton may lose its freshness and flavor and, even if the dry and finally-divided material is not a food, the contents may easily spill from the container should it be inadvertently tipped or dropped.

In some cartons, the score or perforation lines define a flap which may be pushed inwardly to provide a discharge opening. After such a carton is open and is tipped to dispense its contents, it frequently occurs that the material within the carton bears against the inwardly folded flap and tends to close it, thereby preventing or restraining the outflow of the carton's contents.

Accordingly, it is an object of the present invention to provide a closure means for a dispensing carton which overcomes the aforementioned defects and disadvantages of present carton construction. Another object is to provide a carton having a discharge opening and having an element which may be easily manipulated for opening and closing the carton.

Other objects will appear from the specification and drawings in which:

FIGURE 1 is a perspective view of a carton having closure means embodying the present invention;
FIGURE 2 is a perspective view similar to FIG. 1 but showing the closure element in partially raised condition;
FIGURE 3 is a plan view of reduced scale showing a blank from which the carton of FIGURES 1 and 2 may be formed;
FIGURE 4 is a horizontal sectional view taken along line 4--4 of FIG. 1;
FIGURE 5 is a perspective view of a flow control element adapted to be inserted into a carton and constituting a second embodiment of the present invention;
FIGURE 6 is a plan view of a blank from which the unit of the second embodiment is formed;
FIGURE 7 is a broken perspective view illustrating a carton equipped with the insert element as shown in FIG. 5, portions of the top and front wall of such carton being removed to expose the element;
FIGURE 8 is a broken perspective view similar to FIG. 7 but showing the carton in open condition for pouring.

In the embodiment of the invention illustrated in FIGURES 1 through 4, the numeral 10 generally designates a carton having top, bottom, front, rear and side walls 11-15 respectively. Like an ordinary cardboard carton for powdered detergents and other dry, finally-divided materials, carton 10 has walls of rectangular shape. However, it is to be understood that considerable variation in the shapes and proportions of the walls may be provided depending upon the preferences of manufacturers and users and upon the type of goods packaged therein.

As shown in FIG. 3, the entire carton, including the flow control means provided thereby, may be formed in one piece from a single sheet or blank 16 of cardboard or other suitable material. The blank is folded along fold lines 17 with top portion 18 being superimposed on top portion 19 which in turn is folded over portions 20. These portions are adhesively secured in superimposed relation to form the top wall 11 shown in FIGURES 1 and 2. Similarly, the lower portions 21-23 of the blank are folded upon each other and are secured together to form the bottom wall 12 of the carton. Front wall 13 is formed from front panels 24 and 25 which have their lateral edge portions adhesively secured together, as indicated in FIG. 4.

Panels 24 and 25 of the front wall 13 are provided with diecut openings 26 and 27 which register with each other to provide a discharge opening or port 28 when the blank has been folded to form the carton illustrated in FIGURES 1 and 2. Thus, the discharge opening extends completely through the front wall 13 of the carton and is disposed adjacent the upper end thereof. While, in the illustration given, opening 28 is diamond-shaped, it will be understood that openings of other shapes may be provided. It has been found, however, that an opening which tapers upwardly and downwardly from a wide intermediate point is particularly advantageous because it permits greater control of the flow of material therefrom.

Referring to FIG. 3, it will be seen that the outer panel 18 of the top wall is provided with an extension 29 formed integrally therewith. The extension is narrower than the lateral dimensions of the top wall and is folded upon itself adjacent the front edge of that wall to provide a pull tab 30 (FIGURES 1 and 2). When the blank is folded to form the carton, the free end of extension 29 is urged downwardly through an opening 31 at the upper end of the inner front wall 25 and is disposed between front panels 24 and 25 to provide a closure for discharge opening 28. Therefore, in the completed carton, extension 29 becomes a closure element having a vertical depending forward portion 32 or tongue 32, a horizontal upper portion 33 and a pull tab 30 which, if desired, be folded rearwardly upon the top wall 11 to reduce the packing space required for the carton and to prevent injury to the closure means. It will be noted that the horizontal upper portion of the closure element is defined by perforation lines 34 along the inner panel of the top wall 11 and extending rearwardly from the front edge of that wall to points intermediate front and rear walls 13 and 14 respectively.

With lateral edge portions sealed together, the inner and outer panels 24 and 25 of the front wall 13 define a space 35 therebetween for snugly but slidably received the depending portion 32 of the closure element 29. The depending portion of the closure element has straight vertical sides and preferably is of a length substantially greater than the length of the upper portion 33. Specifically, it has been found that best results are obtained where the length of portion 32 is greater than the hypotenuse of a triangle formed by upper portion 33, front portion 32 and the top of the carton when the upper portion 33 has been swung upwardly into vertical position.

As a result, the depending portion of the closure element will not be withdrawn from slit 31 at the upper
end of the front wall even when the closure element has been lifted to its fullest extent.

To open a carton embodying the invention of FIGURES 1 through 4, a user simply lifts tab 30 upwardly to tear the upper portion 33 of the closure element upwardly and rearwardly along the parallel perforation lines 34 and, at the same time, to lift the depending front portion of the closure element upwardly through the space 35 between the inner and outer panels of the front wall 13. After the lower edge of the closure element has been lifted above the discharge opening 28, the carton may be tipped and the contents may be poured therefrom. When the desired amount of material has been dispensed, tab 30 is simply pulled downwardly so that the depending portion of the closure element is again interposed between openings 26 and 27 in the inner and outer panels of the front wall and thereby seals the discharge opening 28. It will be noted that the amount of material flowing through the discharge opening when the closure element is lifted may be controlled by selecting the position of that element between partially and fully raised position.

In the embodiment illustrated in FIGURES 5–8, the flow control and closure means comprises an elongated strip of cardboard or other foldable and flexible material which is transversely folded into seven sections 41–47 inclusive. End section 41 is of substantially the same length as section 42, the two sections being provided with openings 48 and 49 which register with each other when the two sections are folded together. Spacer elements 50 in the form of inwardly turned lateral portions of section 42 are disposed between the two sections and define a space or passage 51 for slidably receiving section 47 disposed at the opposite end of the strip. In FIG. 5 it will be seen that the spacer elements 50 are wider at their upper ends to provide shoulders 52 adapted to be engaged by projections 53 at the free end of section 47 so as to limit upward sliding movement of that section within the space 51. Section 41 may be secured to the spacer elements 50 by a suitable adhesive or by any other appropriate means.

Sections 43 and 44 are of substantially the same length and are adapted to be folded in superimposed relation with the two sections adhesively secured together. The upper section 46 is provided with a pair of spaced perforation lines 54 which extend rearwardly from the front end thereof and terminate at points spaced from the rear edges of the folded sections. It will be observed that the central area defined by the perforation lines is not adhesively secured to section 43 so that it may later be lifted when the closure unit is operated.

Also, sections 40 and 47 are a pair of reversely folded sections 45 and 46 which together provide a tab for moving section 47 upwardly and downwardly within space 51. It will be noted that the width of sections 45 and 46 of the tab 55, as well as that portion of section 47 above projections 53, are of substantially the same width as the central area of section 46 defined by the longitudinal perforation lines 54. Near its lower end, section 47 is provided with an opening 56 which may be of the same shape and size as openings 48 and 49 and which is adapted to be moved into register with those openings when the sliding section 47 is lifted to the fullest extent permitted by stops 52 and projections 50.

When the sections of the strip have been secured together with section 47 disposed within the space 51 between sections 41 and 42, section 47, tab 55 and the central portion of section 40 defined by perforation lines 54 define an opening and closing element for sealing and unsealing in which the folded strip is mounted. It is apparent that section 47 will normally be disposed in vertical position and will constitute the vertical portion or tongue of the closure element, the central portion of strip section 40 defined by the perforation lines 54 constituting the horizontal portion of that element. The edge portions of sections 40 and 41 may be adhesively secured to the inner surfaces of a carton 57 and the carton may be perforated to provide removable wall sections 58 which may be removed to expose the opening and closing means (FIG. 7). Thus, a manufacturer simply inserts and secures the folded strip in place prior to filling the carton and the consumer has only to remove the wall sections 58 defined by perforation lines in order to expose the opening and closing means. To operate the closure means, the user lifts the tab 55 exposed by the removal of wall sections 58 to tear section 40 along perforation lines 54 and to slide the front portion of the closure element upwardly into fully raised position (FIG. 8). It will be noted that when the removable wall sections 58 have been torn away from the carton, the sections 41 and 42 of the insert element form portions of the carton's front wall and perform substantially the same functions as panels 24 and 25 of the carton illustrated in FIGURES 1–4.

Aside from the fact that the closure means illustrated in FIGURES 5 through 8 is not formed integrally with the carton or box in which it is located, the structure of the second embodiment differs from the first construction illustrated in FIGURES 1 through 4 by the provision of spacer elements 50, stop means 52 and projections 53. Also, it will be noted that in the second embodiment, the tongue of the closure element is provided with an opening through which material passes when the element is raised and the carton is tipped into pouring position. It will be understood, however, that these features may also be provided in the construction illustrated in FIGURES 1–4 and, conversely, that the spacers, stop means and opening 56 may be eliminated from the second form (as in the first embodiment) without departing from the principles of the present invention.

While in the foregoing I have disclosed two embodiments of the present invention in considerable detail for purposes of illustration, it will be understood by those skilled in the art that many of these details may be varied considerably without departing from the spirit and scope of this invention.

I claim:

1. A unit adapted to be inserted and secured within a carton for controlling the discharge of the contents thereof, said unit comprising a strip of sheet material having a plurality of transversely folded sections, a pair of said sections being folded and secured in face-opposing vertical relation and defining a vertical passage therebetween, another pair of said sections being folded in superimposed relation and extending horizontally from the upper end of said vertical sections having horizontally aligned openings therethrough, and a third vertical section continuous with the upper of said superimposed horizontal sections and being slidable disposed in said passage for controlling the flow of material through said openings when said unit is secured within a carton said third section being provided with an opening therethrough and being capable of being shifted to move the opening thereof into register with the aligned openings of said first- and second-mentioned sections.

2. The structure of claim 1 in which means are provided by at least one of said first-mentioned pair of vertical sections for limiting the extent of upward sliding movement of said third vertical section.

3. In a carton having a wall formed from two sections of sheet material secured together in facing relation and having a passage extending between and along the opposing surfaces of said sections, a pair of openings in register with each other and communicating with the interior of said carton for the discharge of the contents therefrom, and a closure element having a portion thereof slidable disposed between said sections for controlling the flow of material through said openings, said element also having a second portion normally extending at substantially right angles to said...
first portion and being secured at its remote end to a wall of said carton adjacent to said first-mentioned wall, and a pull tab provided by said closure element between said portions, said first-mentioned portion of said closure element being provided with an opening therethrough, said closure element being capable of being shifted to move the opening thereof into register with the openings provided by the said sections.

4. The structure of claim 3 in which said carton and said closure element are formed integrally from a single diecut sheet of flexible board material.

5. The structure of claim 3 in which said closure element and said sections of sheet material are formed integrally with each other and are adapted to be inserted and secured in a carton.

6. The structure of claim 3 in which said first-mentioned portion of said closure element is provided adjacent the free end thereof with lateral projections, one of said sections being provided with stop means engageable with said projections for limiting the extent of upward sliding movement of said first-mentioned portion within said passage when all of said openings are in register.

7. In a carton having a wall formed from two sections of sheet material secured together in facing relation and having a passage extending between and along the opposing surfaces of said sections, said sections also having a pair of openings in register with each other and communicating with the interior of said carton for the discharge of the contents therefrom, and a closure element having a portion thereof slidably disposed between said sections for controlling the flow of material through said openings, said portion having an opening therethrough registrable with the openings of said sections when said closure element is slid into a raised position, said portion also having straight parallel side edges extending downwardly a substantial distance beyond the lower limits of the opening thereof, said closure element also having a second portion normally extending at substantially right angles to said first portion and being secured at its remote end to a wall of said carton adjacent to said first-mentioned wall, and a pull tab provided by said closure element between said portions.

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