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HYDRAULIC CARTON TESTER

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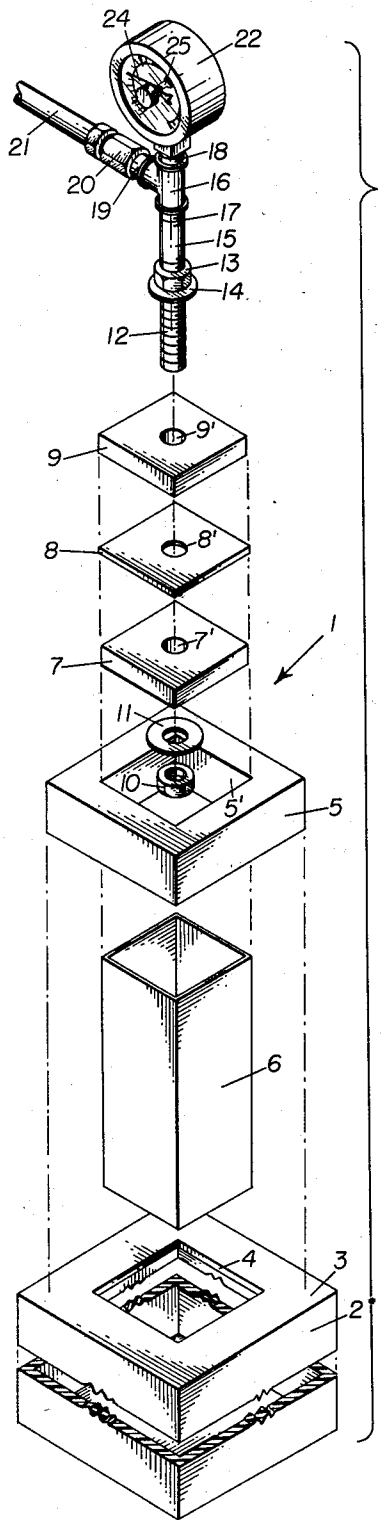
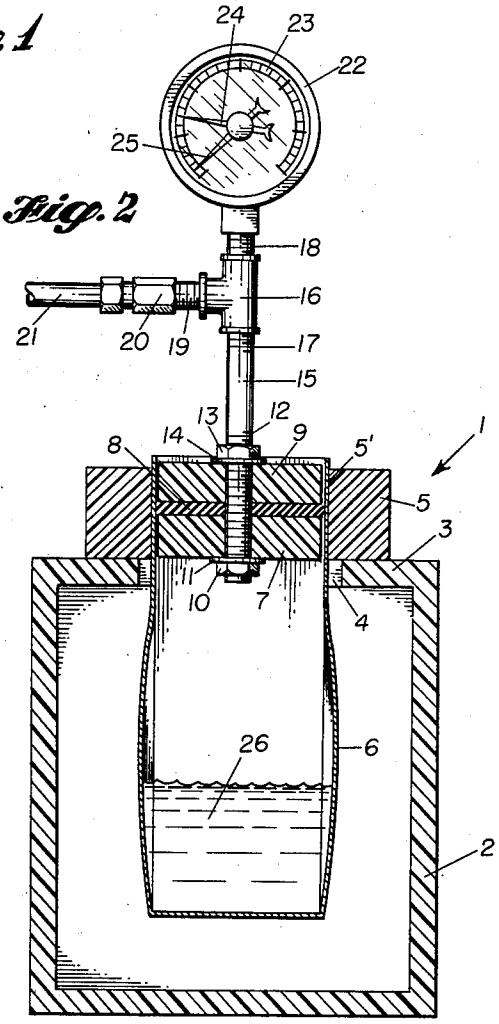


Fig. 1

Fig. 2



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HYDRAULIC CARTON TESTER

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This invention relates to hydraulic carton testers that positively seal and support a carton when testing the carton for bursting strength.

With the development of cartons, new problems have arisen concerning the evaluation of the joints which form the carton. These problems include the selection of a material to be applied to the carton so that the carton surfaces can be attached to each other to form the carton. Moreover, a proper amount of material is required to be placed on the carton so that a proper joint can be made.

Heretofore, formed cartons were evaluated in the dairy or converting plant by physically tearing apart the freshly made seams and observing subjectively the force of the pull. Also, if dry spots were observed in the adhered areas, the carton was considered to be of a poor grade since parts of the seam would not be properly joined. This method has proved to be unsatisfactory because it is not a true evaluation of an adhered seam since it cannot be correlated to the bursting strength of the carton.

I have discovered a carton tester that subjects an internal hydrauclic pressure to the carton to be tested to the point of rupture of the carton. This carton tester includes a rigid support member with a hole therethrough so that the carton can extend therein. A supporting seal then is placed inside the carton and caused to expand and seal the carton and a fluid is pumped into the carton. The hydraulic pressure is measured to determine at what pressure the carton bursts.

An object of this invention is to provide a device for clamping a carton in a device in such a fashion that water can be pumped into the carton and finally cause it to rupture.

Another object of this invention is to provide a hydraulic carton tester that positively seals and supports a carton in the tester which measures the pressure at which the carton ruptures.

These and other objects and advantages will become manifestly clear to those skilled in the art when taken in conjunction with the detailed description and drawings, wherein:

FIGURE 1 is a prespective, exploded view of the hydraulic carton tester.

FIGURE 2 is a cross-sectional view of the hydraulic carton tester with the carton supported and sealed therein.

Referring now to the drawings, the hydraulic carton tester is generally indicated at **1** and comprises a box-like form or member **2** with an opening **4** through an upper wall **3** for extending a carton **6** therethrough. Resting on the upper surface of the upper wall **3** is a support member **5** having an opening **5'** therethrough. A carton **6** extends through the opening **5'** with the open upper end of the carton **6** adjacent the upper surface of the support member **5**.

Extending into the open upper end of the carton **6** is a sealing and supporting structure comprising a lower plate member **7** having an opening **7'** therethrough and an upper plate member **9** having an opening **9'** therethrough. Between the plate members **7** and **9** is positioned a deformable gasket member **8** having an opening **8'** extending therethrough. Extending through the openings through the members **7**, **8**, and **9** is a pipe member **15** having a threaded portion **12** thereon. Connected to the lower threaded portion is a nut member **10** having a washer **11** thereabove which supports the entire sealing and supporting structure. Above the upper plate member **9** is positioned a tightening nut **13** having a washer **14** adjacent the plate member **9**.

The upper end of the pipe **15** is provided with threads **17** which connect a T connection **16** thereto. Connected to one outlet of the T connection **16** is a threaded nipple **18**. Connected to the lateral outlet of the T connection **16** is another threaded nipple **19** which is threaded onto a union member **20** which in turn is connected to a pipe member **21** that is connected to a water pressure source, not shown.

A gauge member **22** is connected to the threaded nipple **18**. The gauge **22** is provided with the usual calibrations **23**. Also, the gauge is provided with a pair of arm members **24** and **25**. The arm indicator **24** is the usual indicator which registers the pressure transmitted into the carton **6** and the indicator arm **25** is a maximum registrating indicator or a "lazy arm" that registers the maximum pressure at which the carton **6** bursts.

In operation, the box-like structure **2** is placed on a table or other suitable support member, not shown, and the carton **6** to be tested is filled or partially filled with water **26**. The support member **5** then is placed on top of the upper wall **3** with the opening **5'** directly above and coextensive with the opening **4** through the upper wall **3**.

The carton **6** having the water **26** therein is then placed in the opening **5'** with the upper end thereof adjacent the upper surface of the support member **5**. The pipe member **15** is then positioned in the open upper end of the carton **6** with the lower plate **7**, gasket **8** and upper plate **9** supported by the washer and nut **10** and **11**. The nut **13** is now tightened so that the member **8** sandwiched between the plates **7** and **9** is deformed to provide a fluid-tight seal which supports the carton **6**.

Water or other liquid can now be pumped from a source not shown, through the pipe **21** and down through pipe **15** into the carton **6**. As the pressure thereof builds up, the indicator arm **24** will register the amount of pressure thereof. The "lazy arm" or maximum registering are **25** will also register this pressure and can be readily read by the calibrations **23**. Accordingly, when enough pressure is pumped into the carton **6** it will burst. The pressure at which the carton **6** bursts can be readily read on the gauge **22** and can be correlated to indicate whether the adhesives used to make the carton are of the proper strength.

While specific details of a preferred embodiment have been set for above, it will be apparent that many changes and modifications may be made therein without departing from the spirit of the invention. It will therefore be understood that what has been described herein is intended to be illustrative only, and it is not intended to limit the scope of the invention.

What is claimed is:

I claim:

1. A hydraulic tester for determining the bursting strength of a carton or the like, comprising: a supporting member having an opening therethrough for receiving the carton to be tested, a sealing and supporting structure adapted to be extended into the open upper end of a carton, including a lower plate member supported on a threaded pipe means, an upper plate member supported by said threaded pipe means and a pliant gasket member supported by said threaded pipe means and positioned between said upper and lower plate members, means on said pipe member to move said upper plate member downwardly relative to said lower plate member to expand

said gasket member outwardly and form a seal around said open upper end of said carton, said carton and said structure frictionally supported by the engagement of said gasket member with said supporting member, and gauge means connected to said threaded pipe for measuring the pressure of fluid pumped into said carton through said pipe means.

2. A hydraulic tester in accordance with claim 1 wherein said support means rests on top of a box-like member having the lower end of said carton extending therein.

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