

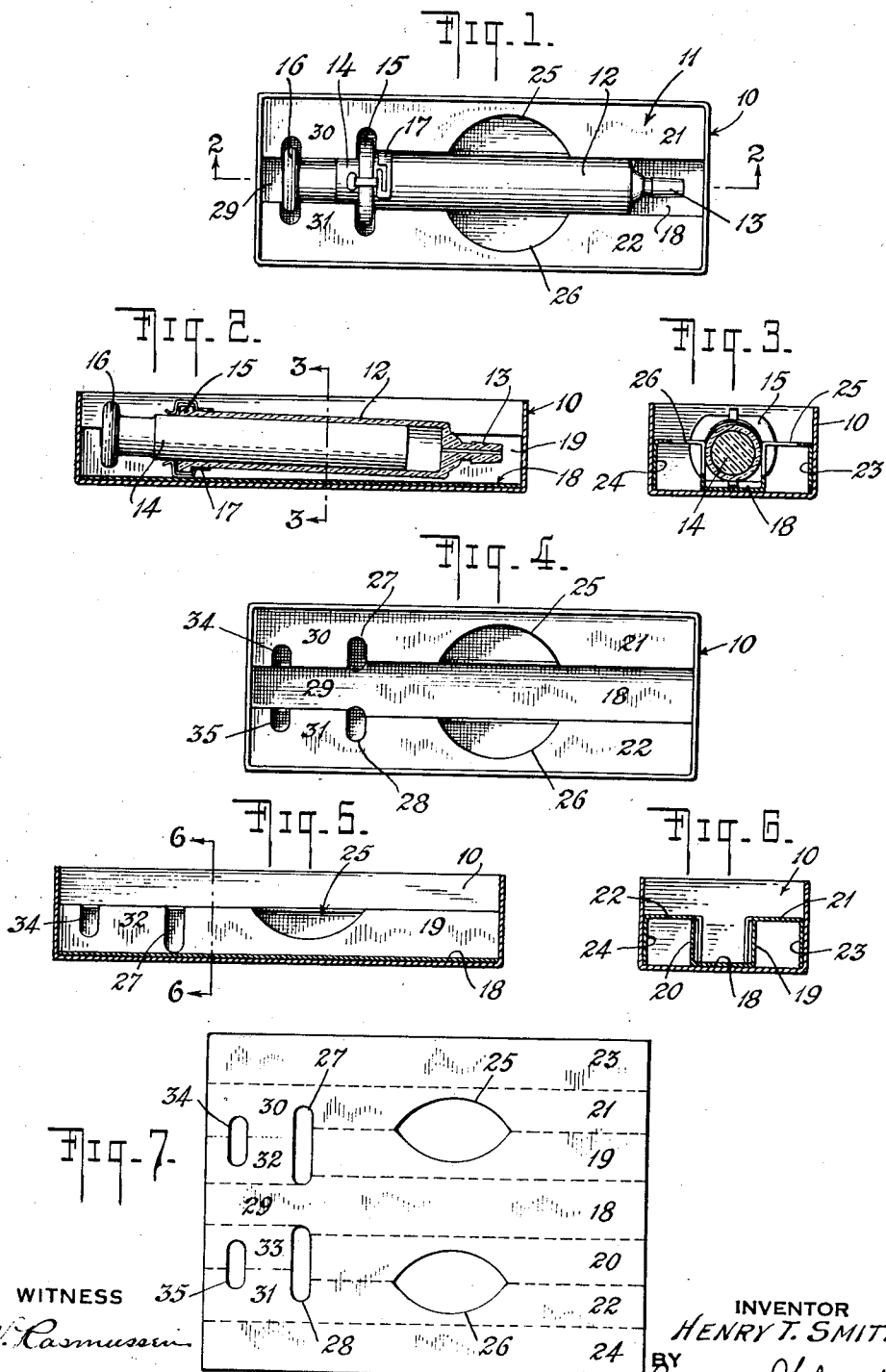
June 22, 1937.

H. T. SMITH

2,084,540

CARTON FOR GLASS SYRINGES

Filed Jan. 5, 1937



WITNESS
G. T. Rasmussen

INVENTOR
HENRY T. SMITH
BY
Priscilla Schenk
ATTORNEYS

UNITED STATES PATENT OFFICE

2,084,540

CARTON FOR GLASS SYRINGES

Henry T. Smith, Wood-Ridge, N. J., assignor to
Becton, Dickinson & Co., Rutherford, N. J., a
corporation of New Jersey

Application January 5, 1937, Serial No. 119,063

11 Claims. (Cl. 206—43)

This invention relates to cartons and more particularly to cartons adapted for the packaging and shipment of glass hypodermic syringes and has for its object to provide a medium which, besides holding and supporting the syringe parts in a definite position, will provide means for protecting the syringe against breakage.

Among the most widely used hypodermic syringes is one variety which comprises a tubular glass barrel having an interiorly ground cylindrical surface, etched or ground or colored lines on the exterior surface to indicate the volume of the fluid contained in the syringe and the amount used, and a tapered ground-glass nozzle for the accommodation of the customary needle hub. The open end of the barrel is, as a rule, provided with laterally extending flat glass flanges against the under side of which the fingers of the operator are placed in effecting an injection. All of these parts of the barrel represent an integral body of glass. A glass plunger having an exteriorly ground cylindrical surface approximately coextensive with the interior dimensions of the barrel, and but infinitesimally smaller in diameter than the interior diameter of the barrel, occupies the space within the barrel. The plunger is usually provided with an enlarged head at its outer end to furnish a convenient means for effecting outward movement of the plunger in filling the barrel with fluid and for permitting the thumb of the operator to press upon when an injection is made. The plunger, like the barrel, represents an integral body of glass.

Heretofore it has been the general practice in the packaging and shipment of such syringes, to place a small disc or washer of cork or like cushioning material within the barrel, then to push the piston into the barrel as far as it will go, the washer providing a spacing means to prevent the front face of the plunger from making contact with the inner front face of the barrel and in this assembled condition the syringe was laid into a carton provided with two open pockets at the two ends thereof and two transversely extending cardboard struts cut out to receive and to support the mid-section of the barrel. The open pockets at the two ends were filled with cotton or the like so that at one end the cotton surrounded the ground-glass tip of the barrel while at the other end the flanges of the barrel and the outer portions of the plunger and its enlarged head were also embedded in cotton. Inasmuch as the space provided in the cardboard struts adjacent to the mid-section of the barrel approximated the cross-sectional dimension of the barrel and the extremities of the syringe were embedded in cotton packing, the barrel was maintained against movement from side to side in its container while the cotton pack-

ing at the two ends of the syringe also prevented movement of the plunger relative to the barrel or vice versa and incidentally protected the wrapper parts against breakage. The cork washer took up any shock which might be occasioned by the tendency of the plunger to move further down into the barrel during shipment.

The object of the present invention is to eliminate many of the features characteristic of the conventional method of packaging glass syringes to make it unnecessary to employ extraneous protective means such as washers or cotton and to render the container or carton simple and inexpensive while providing for all of the protective features which are necessary.

This object is attained by so constructing the inner parts of that section of the carton within which the syringe is to be supported as to form a channel or trough adapted to receive the barrel and to provide spaced apertures for receiving the flange on the upper end of the barrel on the one hand and the expanded head of the plunger on the other, the space between the flange-receiving and the head-receiving apertures being substantially greater than the distance between the plunger head and the barrel flange when the plunger is in contact with the bottom end of the syringe barrel.

The invention will be better understood from the following description, together with the attached drawing showing a preferred form of the invention in which Fig. 1 is a top view of a carton with the cover removed to show the manner in which a syringe is disposed in a filler made according to the invention; Fig. 2 is a longitudinal section taken along the line 2—2 of Fig. 1; Fig. 3 is a section taken along the line 3—3 of Fig. 2; Fig. 4 is a view similar to Fig. 1 with the syringe omitted to show the filler more clearly; Fig. 5 is a longitudinal central section of Fig. 4; Fig. 6 is a section taken along the line 6—6 of Fig. 5 and Fig. 7 is a plan view of the blank from which the filler shown in Figs. 1 to 6 is made.

In the drawing, 10 designates the tray of a syringe carton and 11 the support or filler thereof for receiving a hypodermic syringe to be packed in the carton. As shown in Figs. 1 to 3 of the drawing, the syringe comprises the customary tubular glass barrel 12, terminating at one end in a nozzle 13 or equivalent means for the accommodation of the usual hypodermic needle in the conventional manner. A plunger 14 which may be made of glass is arranged to slidably fit the interior of the barrel. In order to facilitate the operation of said plunger 14 in the barrel 12, a flange 15 is provided on the upper end of the barrel 12 and a head 16 is provided at the outer end of the plunger 14. A suitable clamping means 17 is shown mounted on the barrel 12 for frictionally engaging with the

plunger 14 to maintain the latter against unintentional sliding movements lengthwise of the barrel.

The open box or tray 10 is made of cardboard or other suitable material and is provided with a cover (not shown) of any suitable construction. As is shown more clearly in Fig. 1, the tray 10 has a width approximately three times greater than the diameter of the syringe barrel and has a length materially greater than the overall length of the syringe with the plunger partly withdrawn so that there is a space between the barrel nozzle and one end of the tray and a space between the plunger head and the other end of the tray.

The filler 11 is made from a rectangular blank of cardboard having a length similar to the interior length of the tray and a width slightly greater than twice the interior width of the tray. As is shown more clearly in Fig. 7, the filler 11 is creased lengthwise to provide seven longitudinally extending panels, the central panel 18 thereof forming the base and the intermediate panels 19 and 20 the sides of a syringe-receiving trough or channel when the filler is assembled in the tray and the intermediate panels 21 and 22 forming spacing members which are laterally disposed in the tray 10 and are supported along their outer edges by the end panels 23 and 24, the widths of the panels 19, 20, 23 and 24 being similar so that the panels 21 and 22 are maintained in horizontal position in the casing. The central panel 18, in the region where the barrel of the syringe is to be contained, has a width substantially the same as the outside diameter of the syringe barrel and the transverse panels 21 and 22 in the same region, each have a width equal to one-half the difference in width between the interior width of the container and the diameter of the syringe barrel so that when the syringe is inserted in the trough or channel, the panels 19 and 20 will snugly engage the outer surfaces of the syringe barrel. The abutting edges of the adjoining panels 19 and 21 and the adjoining panels 20 and 22 are cut away to provide a pair of oppositely disposed openings 25 and 26 in the filler on each side of the barrel so that the insertion or removal of the syringe in the filler may be facilitated.

Intermediate the openings 25 and 26 and one end of the filler are provided a pair of transversely extending elongated openings 27 and 28, the opening 27 extending completely across the panel 19 and into the panel 21 and the opening 28 which is on a line with the opening 27, extending completely across the panel 20 and into the panel 22. Each of the openings 27 and 28 has a width slightly greater than the width of the barrel flange 15 which they are adapted to receive and a length such that when the filler is assembled in the tray, the oppositely disposed portions thereof in the panels 21 and 22 will readily receive the barrel flange 15. The aligned openings 27 and 28 are spaced from the opposite end of the blank, a distance greater than the combined length of the barrel 12 and nozzle 13 of the syringe so that the outer end of such nozzle cannot come into contact with the adjacent end of the tray 10 when the syringe is disposed in the filler.

The central panel 18 between the openings 27 and 28 and the adjacent end of the filler blank is reduced in width to provide a narrower portion 29, the width of the portion 29 being substantially the same as the diameter of the plunger 14.

The end portions 30 and 31 of the panels 21 and 22, respectively, in this region are correspondingly increased in width so that the displaced portions 32 and 33 of the intermediate panels 19 and 20, respectively, which form the sides of the trough or channel in this region, will snugly engage the outer surfaces of the plunger proper. The widths of the displaced portions 32 and 33 are the same as the widths of the panels 19 and 20 so that the panels 21 and 22 are disposed in substantially horizontal position throughout their entire lengths.

Intermediate the openings 27 and 28 and the adjacent end of the filler blank are a pair of aligned transversely extending openings 34 and 35, the opening 34 being disposed in and extending across the abutting edges of the panel portions 30 and 32 and the opening 35 being disposed in and extending across the abutting edges of the panel portions 31 and 33. Each of the openings 34 and 35 has a width slightly greater than the width of the plunger head which they are adapted to receive and a length such that when the filler is assembled in the tray, the oppositely disposed portions thereof in the transverse panel portions 30 and 31 will readily receive the plunger head. The distance between the aligned openings 27 and 28 and the aligned openings 34 and 35 is substantially greater than the distance between the plunger head and barrel flange of the syringe when the plunger 14 is fully inserted in the syringe barrel 12 so that its inner end is in contact with the inside bottom or seat of the syringe barrel whereby, when the syringe is disposed in the receiving channel with the head of the plunger and the barrel flange inserted in their respective openings, as shown in Fig. 1, the inner end of the plunger is maintained in spaced relation from the inside bottom of the syringe barrel, as is clearly shown in Fig. 2.

In assembling the filler in the tray 10, the central panel 18 is positioned centrally of the tray against the bottom of the latter. Preferably a strip of glue is first applied to the bottom of the tray or the central panel 18 so that such panel becomes affixed to the tray. The remaining panels are then inserted in proper position in the tray, the side panels 19 and 20 being placed in upstanding or vertical position and the end panels 23 and 24 being turned downwardly so that their outer edges rest on the bottom of the tray adjacent the inner sides of the latter, as is shown in Figs. 3 and 6. The transverse panels 21 and 22 which function as spacing members to maintain the side panels 19 and 20 in proper position will be supported in horizontal position by the side panels 19 and 20 and the end panels 23 and 24. The aligned openings 25 and 26 enable the packer to readily place the syringe in the tray, the plunger of the syringe before such insertion being pulled out slightly so that when the barrel flange 15 is inserted in the aligned openings 27 and 28, the head 16 of the syringe will fit into the aligned openings 34 and 35. It will be seen that when the syringe is inserted properly in the filler of the tray, the head of the plunger and the flange on the barrel will be positively spaced apart so that it becomes unnecessary to place a shock-absorbing element between the inner end of the plunger and the inner bottom end of the barrel. Furthermore, the distance between the barrel flange positioning apertures and the farther end of the carton is such that the tip or nozzle of the barrel will never come

into contact with the carton end. Sidewise or longitudinal movement of the syringe barrel or piston in the carton is prevented by the plunger head and barrel flange positioning openings and by the provision of the side panels 19 and 20 to cushion lateral movement of the barrel as shocks of unusual magnitude are laterally effective. The invention dispenses with the need for embedding the syringe ends in cotton to prevent breakage.

Various changes in the construction and arrangement of the specific form shown and described may be made within the scope of the claims without departing from the spirit of the invention.

I claim:

1. A box for a syringe having a barrel provided with a flange and a plunger provided with a head, said box comprising a tray and a filler fitted into said tray, said filler including a pair of spacing panels and a trough-like section disposed between said panels and adapted to receive a syringe, said spacing panels and the sides of said trough-like section being provided with positioning openings adapted to receive the barrel flange and the plunger head of the syringe, the distance between the barrel flange positioning opening and the plunger head positioning opening being substantially greater than the distance between the barrel flange and the head of the plunger when the plunger is fully inserted in the syringe barrel.

2. A box for a syringe having a barrel provided with a flange and a plunger provided with a head, said box comprising a tray having its dimension in the direction in which a syringe will lie therein substantially greater than the overall length of such syringe, a filler fitted into said tray and including a pair of spacing panels and a trough-like section disposed between said panels and adapted to receive a syringe, said trough-like section being provided with positioning openings adapted to receive the barrel flange and the plunger head of the syringe, the distance between the barrel flange positioning opening and the plunger head positioning opening being substantially greater than the distance between the barrel flange and the plunger head when the plunger is fully inserted in the syringe barrel, and the distance between the barrel flange positioning opening and the side of the tray towards which the bottom of the syringe projects being substantially greater than the distance between the barrel flange and the lower end of the syringe.

3. A box for a syringe having a barrel provided with a flange and a plunger provided with a head, said box comprising a tray, a filler fitted into said tray and including a pair of spacing panels and a trough-like section disposed between said panels and adapted to receive a syringe, said trough-like section being provided with positioning openings adapted to receive the barrel flange and the plunger head of the syringe, the distance between the barrel flange positioning opening and the plunger head positioning opening being substantially greater than the distance between the barrel flange and the plunger head when the plunger is fully inserted in the syringe barrel, and the distance between the barrel flange positioning opening and the side of the tray towards which the bottom of the syringe projects being substantially greater than the distance between the barrel flange and the lower end of the syringe, the cross-sectional area of said trough-like section in the region occupied by the syringe plunger being smaller than the cross-sectional area of such section

in the region occupied by the syringe barrel.

4. A box for a syringe having a barrel provided with a flange and a plunger provided with a head, said box comprising a tray, a filler fitted into said tray and including a central panel adapted to rest on the bottom of said tray, intermediate panels projecting upwardly from the central panel and forming with the latter a trough-like section adapted to receive a syringe, and lateral panels joined to the upper edges of said intermediate panels to hold the latter in proper position, said intermediate panels and said lateral panels being provided with barrel flange and plunger head receiving openings, the distance between the barrel flange receiving opening and the plunger head positioning opening being substantially greater than the distance between the barrel flange and the plunger head when the plunger is fully inserted in the syringe barrel, and the distance between the barrel flange positioning opening and the side of the tray towards which the bottom of the syringe projects being substantially greater than the distance between the barrel flange and the lower end of the syringe.

5. A box for a syringe having a barrel provided with a flange and a plunger provided with a head, said box comprising a tray, a filler fitted into said tray and including a central panel adapted to rest on the bottom of said tray, intermediate panels projecting upwardly from the central panel and forming with the latter a trough-like section adapted to receive a syringe, and lateral panels joined to the upper edges of said intermediate panels to hold the latter in proper position, said intermediate panels and said lateral panels being provided with barrel flange and plunger head receiving openings, the distance between the barrel flange receiving opening and the plunger head positioning opening being substantially greater than the distance between the barrel flange and the plunger head when the plunger is fully inserted in the syringe barrel, and the distance between the barrel flange positioning opening and the side of the tray towards which the bottom of the syringe projects being substantially greater than the distance between the barrel flange and the lower end of the syringe, means securing said central panel to the bottom of the tray and means for holding the outer edges of said lateral panels spaced from the bottom of the tray.

6. A box for a syringe having a barrel provided with a head, said box comprising a tray, a filler fitted into said tray and including a central panel adapted to rest on the bottom of said tray, intermediate panels projecting upwardly from said central panel and forming with the latter a trough-like section adapted to receive the syringe, lateral panels joined to the upper edges of said intermediate panels and end panels joined to the outer edges of said lateral panels and projecting downwardly to the bottom of the tray to hold the outer edges of said lateral panels spaced from the bottom of the tray, said intermediate and said lateral panels being provided with barrel flange and plunger head receiving openings, the distance between the barrel flange receiving opening and the plunger head receiving opening being substantially greater than the distance between the barrel flange and the plunger head when the plunger is fully inserted in the syringe barrel, said central panel having a greater width in the region occupied by the syringe barrel than in the region occupied by the plunger and said lateral panels having a greater width in the region in which the plunger is disposed than

in the region in which the barrel is disposed.

7. A box for a syringe having a barrel provided with a flange and a plunger provided with a head, said box comprising a tray, a filler fitted into said tray and having a plurality of panels, each of which is substantially longer than the length of the syringe to be contained in said box, said filler including a central panel adapted to rest on the bottom of said tray, intermediate panels projecting upwardly from said central panel and forming with the latter a trough-like section adapted to receive the syringe, lateral panels joined to the upper edges of said intermediate panels and end panels joined to the outer edges of said lateral panels and projecting downwardly to the bottom of the tray, each adjoining intermediate panel and lateral panel being provided with a barrel flange receiving opening and a plunger head receiving opening, the distance between the aligned flange receiving openings and the aligned plunger head receiving openings being substantially greater than the distance between the barrel flange and the plunger head of the syringe when the plunger is fully inserted in the syringe barrel, and the distance between the aligned flange receiving openings and the end of the filler towards which the bottom of the syringe projects being substantially greater than the distance between the barrel flange and the lower end of the syringe, the central panel in the region between said flange receiving openings and the other end of the filler having a width smaller than the portion thereof on the other side of such openings and said lateral panels in such region having a width greater than the portions thereof of the other side of such openings.

8. A carton for syringes which are constituted of a glass barrel portion provided with a flange or flanges extending laterally from its open end and a plunger provided with an enlarged head, said carton including inner ledges of relatively stiff constitution maintained above the bottom of the carton at the plunger receiving end of the carton for a distance approximating one-half of the diameter of the barrel of the syringe, said ledges being arranged to provide an aperture to permit the insertion, into said aperture, of the flange of the barrel, of the neck of the plunger, of the expanded head of the plunger, and of at least a part of the barrel, the apertured portion for the plunger neck being of less width than that of the other three said parts of the aperture and the apertured portions for the barrel flanges and for the plunger head being spaced apart a distance greater than the distance between the plunger head and the barrel flange when the plunger is in contact with the bottom end of the syringe barrel.

9. A carton for syringes which are constituted of a glass barrel portion provided with a flange or flanges extending laterally from its open end and a plunger provided with an enlarged head, said carton including inner ledges of relatively stiff constitution maintained above the bottom of the carton at the plunger receiving end of the carton for a distance approximating one-half of the diameter of the barrel of the syringe, said ledges being arranged to provide an aperture to permit the insertion, into said aperture, of the flange of the barrel, of the neck of the plunger, of the expanded head of the plunger, and of at least a part of the barrel, the apertured portion for the plunger

neck being of less width than that of the other three said parts of the aperture and the apertured portions for the barrel flanges and for the plunger head being spaced apart a distance greater than the distance between the plunger head and the barrel flange when the plunger is in contact with the bottom end of the syringe barrel, said carton further including vertically arranged spacing members positioned laterally of the barrel section of the syringe and spaced apart a distance approximating or but slightly wider than the diameter of the barrel.

10. A carton for syringes which are constituted of a glass barrel portion provided with a flange or flanges extending laterally from its open end and a plunger provided with an enlarged head, said carton including inner ledges of relatively stiff constitution maintained above the bottom of the carton at the plunger receiving end of the carton for a distance approximating one-half of the diameter of the barrel of the syringe, said ledges being arranged to provide an aperture to permit the insertion, into said aperture, of the flange of the barrel, of the neck of the plunger, of the expanded head of the plunger, and of at least a part of the barrel, the apertured portion for the plunger neck being of less width than that of the other three said parts of the aperture and the apertured portions for the barrel flanges and for the plunger head being spaced apart a distance greater than the distance between the plunger head and the barrel flange when the plunger is in contact with the bottom end of the syringe barrel, said ledges at their approximately central portions being additionally recessed for permitting ready access of the fingers to the syringe barrel in removing the syringe from the carton.

11. A carton for syringes which are constituted of a glass barrel portion provided with a flange or flanges extending laterally from its open end and a plunger provided with an enlarged head, said carton including inner ledges of relatively stiff constitution maintained above the bottom of the carton at the plunger receiving end of the carton for a distance approximating one-half of the diameter of the barrel of the syringe, said ledges being arranged to provide an aperture to permit the insertion, into said aperture, of the flange of the barrel, of the neck of the plunger, of the expanded head of the plunger, and of at least a part of the barrel, the apertured portion for the plunger neck being of less width than that of the other three said parts of the aperture and the apertured portions for the barrel flanges and for the plunger head being spaced apart a distance greater than the distance between the plunger head and the barrel flange when the plunger is in contact with the bottom end of the syringe barrel, said ledges at their approximately central portions being additionally recessed for permitting ready access of the fingers to the syringe barrel in removing the syringe from the carton, said carton further including vertically arranged spacing members positioned laterally of the barrel section of the syringe and spaced apart a distance approximating or but slightly wider than the diameter of the barrel, said vertical spacing members being recessed in the vicinity of the recessed portions of the ledges.

HENRY T. SMITH.