

Aug. 13, 1968

F. PRADENAS
FASTENING DEVICE

3,396,482

Filed Sept. 6, 1966

2 Sheets-Sheet 1

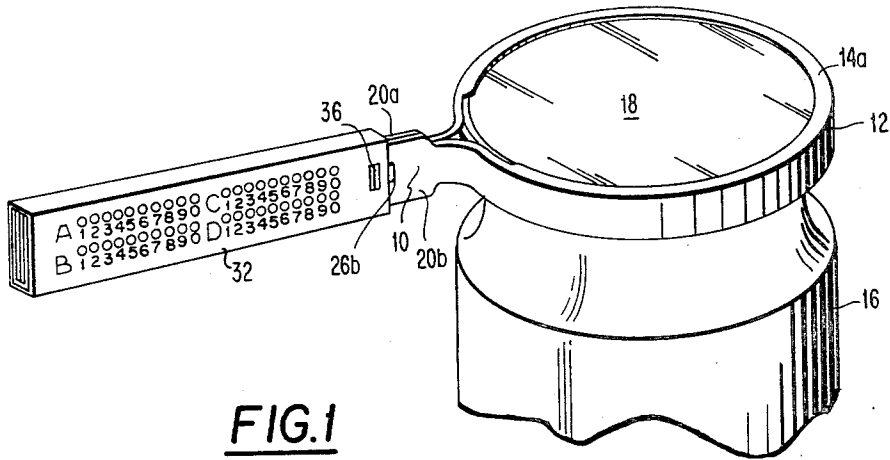


FIG. 1

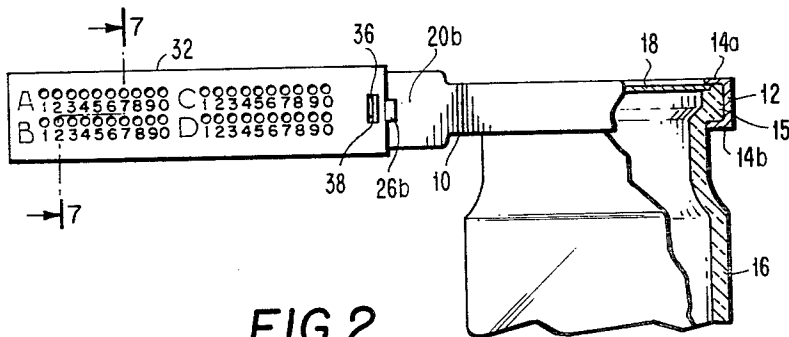


FIG. 2

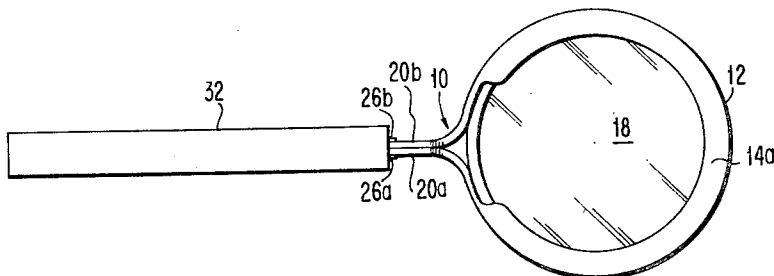


FIG. 3

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Aug. 13, 1968

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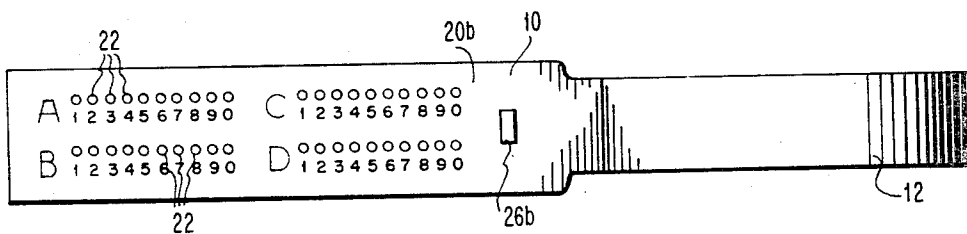


FIG. 4

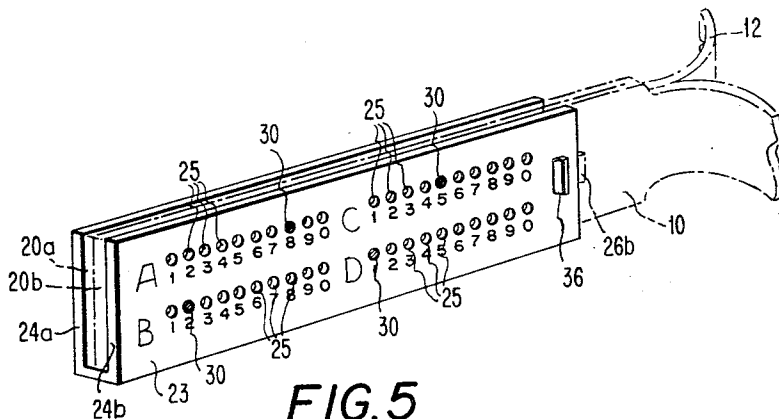


FIG.5

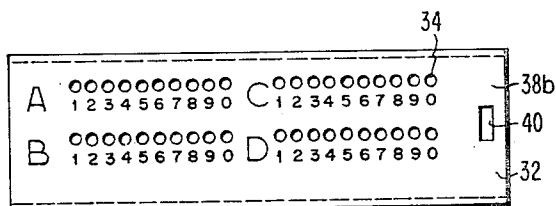


FIG.6

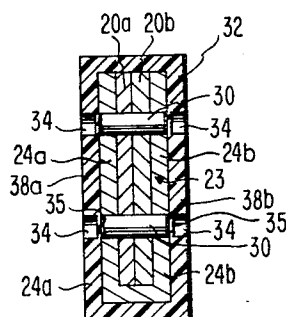


FIG. 7

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3,396,482

FASTENING DEVICE

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Filed Sept. 6, 1966, Ser. No. 577,399
8 Claims. (Cl. 40—2.2)

ABSTRACT OF THE DISCLOSURE

A band type closure retainer. The free ends of the band are held together by a coded seal whereby the container cannot be opened unless the seal is ruptured according to the said code.

The present invention relates to the releasable fastening devices of the type employed to secure lids to jars, bottles and like containers.

When such containers are used to hold typed blood, plasma or pharmaceutical fluids, there is the ever present danger of confusion which may have disastrous consequences. For instance, in case of blood transfusions a nurse may open the wrong container and the wrong type of blood may be infused into a patient.

It is an object of my invention to provide a releasable fastening device of the type referred to, that may be coded in a manner identifying the contents of the container upon which it is used, such that it will open only in response to release manipulations that correspond to the identity of the contents of the container.

Another object of the invention is to provide a codeable fastening device of the type referred to, which upon release, provides a record of the release manipulations. Thus, when an error occurs, the party at fault can be determined, i.e. it can be proven, for instance, whether it was the fault of the attending nurse, or of the technician who filled the container and coded the fastening device.

Still another object of the invention is to provide a codeable fastening device of the type referred to, which is of simple and inexpensive construction, and which is easy to understand and manipulate.

These and other objects of the invention will be apparent from the following description of the accompanying drawings which illustrate a preferred embodiment thereof, and wherein—

FIGURE 1 is a perspective of a fastening device embodying my invention employed to hold the lid of a jar in a closed condition;

FIGURE 2 is a side elevation, partly in section, of the structure shown in FIGURE 1;

FIGURE 3 is a plan view of the structure shown in FIGURES 1 and 2;

FIGURE 4 is a side elevation of a closure strap which forms part of the device of the invention;

FIGURE 5 is a perspective of another component of the fastening device of the invention;

FIGURE 6 is a side elevation of yet another component of the fastening device of the invention; and

FIGURE 7 is a cross section taken along line 7—7 of FIGURE 2 and viewed in the direction of the arrows associated with said line.

Having reference to FIGURES 1 and 2, the numeral 10 identifies a strap which may be made of metal or plastic material. The center portion of said strap is arranged to form a flexible, almost circular loop 12 and the upper and lower edge areas of said loop are bent inwardly to form upper and lower horizontal flanges 14a

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and 14b, respectively. In use these flanges are engaged over the upper and lower surfaces, respectively, of the bead or rim 15 around the mouth of a bottle or jar 16, to hold a lid 18 over the opening of the mouth. The flat end portions 20a and 20b of the strap are bent outwardly to extend radially of the loop 12, somewhat in the manner of the handle of a skillet, as best shown in FIGURE 1. Each of said end portions contains a row or rows of cylindrical holes 22, which are arranged to register with each other when the end portions of the strap are brought into flat contact with each other (FIGURE 4). In the particular embodiment of the invention illustrated in the accompanying drawing each of said end portions 20a and 20b is provided with four such rows which are identified by the letters A, B, C and D respectively, and which are disposed horizontally and are arranged in two juxtaposed sets of each two superposed rows; and each row of holes contains preferably ten holes corresponding to the digits 1 to 0 as shown.

The device of the invention comprises also a U-shaped channel 23 (FIGURE 5) whose side flanges 24a and 24b are approximately of the same depth as the end portions of the strap and whose inner width is such that it may smoothly receive and contain the two juxtaposed end portions 20a and 20b of the strap 10. Provided in the side flanges of said channel 23 are rows of holes 25 which are of size and location corresponding to the rows of holes 22 in the strap end portions so that they may be brought into precise registry with the holes in said strap end portions when the channel is engaged over and contains said end portions in juxtaposed position. In FIGURE 5, the rows of holes 25 in the flanges 24a and 24b of channel 23 have been identified by the same letters as the rows of holes in the end portions 20a and 20b of the strap. To facilitate proper alignment of the holes 25 in the flanges of channel 23 with corresponding holes 22 in the strap end portions, suitable limit stops 26a and 26b may be provided on said strap end portions a limited distance beyond the last holes of rows C and D. (FIGURES 3 and 4.) When the leading end edges of the channel flanges 24a and 24b come against these stops, and the bottom edges of the strap end portions are in contact with the bight portion of the channel 23, proper registration between the holes 22 in the strap end portions and the holes 25 in the flanges of the channel is established.

Cylindrical pins 30 of the type shown in FIGURE 7 are employed to detachably fasten the channel 23 to the end portions of the strap through a limited number of selected individual holes 25 in the rows A, B, C and D, and thus secure the loop 12 of the strap in closed position around the mouth of the jar while at the same time identifying the contents of the jar by the location of the selected holes 25.

Let it be assumed, for example, that the contents of the jar 16 are a type of blood identified by a four digit number, say, 8251. In this event the operator who closes and locks the filled jar with the device of the invention, pushes a pin 30 through the eighth hole in row A of one of the flanges of channel 23, counting from the left, the second hole in row B, the fifth hole in row C and the first hole in row D, as indicated in FIGURE 5. The pins 30 are of an axial length about equal to the external breadth of channel 23 and when pushed fully into the tunnels formed by the registering holes 22 and 25 in the channel flanges and the strap end portions assume the positions shown in FIGURE 7 wherein they fasten the channel detachably to the strap end portions contained therein. Now the channel holds the strap de-

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pendably in a closed position, wherein its loop portion secures the lid 18 to the mouth of the bottle 16.

When this is accomplished, a sheath 32 of rectangular cross section, and a preferably opaque or no more than translucent material, is slipped over the channel 23 and the strap end portions contained therein. It is now impossible for the pins 30 to accidentally be dislodged from the holes 22, 25 in the channel flanges and the end portions of the strap, respectively.

The side walls of the sheath contain rows of cylindrical depressions or recesses 34 (FIGURES 5 and 6) which are arranged in rows corresponding to the rows of holes in the flanges of the channel 23 and the end portions of the strap 10. These depressions in the side walls of the sheath are of sufficient depth that only membrane 35 of the material from which the sheath is made, remains at their bottom. This membrane can easily be broken or torn. In FIGURES 1, 2 and 6 these rows of depressions 34 are again identified by the letters A, B, C and D, and each such row contains ten such depressions corresponding to the number of holes in the rows A, B, C and D in the flanges of the channel 23.

The flanges 24a and 24b of the channel 23 are provided with outwardly projecting shoulders 36 (FIGURES 3 and 5) a short distance beyond the "0" holes of rows C and D, and the side walls 38a and 38b of the sheath 32 contain apertures 40 in an area beyond the "0" depressions of its rows C and D. The sheath 32 is made from a material of sufficient flexibility so that the leading portions of its side walls 38a and 38b will yield and negotiate the shoulders 36 on the flanges of the channel 23 when the sheath 32 is pushed over the channel 23 with sufficient force. Thereupon said shoulders snap into the apertures 40 in the side walls of the sheath and securely hold the sheath in a position wherein its depressions 34 register with corresponding holes 25 in the flanges 24a and 24b of channel 23. The lid 18 of the jar or bottle 16 is now securely held upon the mouth of the container with its contents properly identified, and the container may now be taken to its place of storage.

Let it be assumed, for example, that the contents of the jar or bottle 16 are blood whose type and peculiarities have been properly identified by the particular holes in the four rows of holes in the flanges of channel 23, which are engaged by pins. Let it now be assumed that a patient needs a blood transfusion and a bottle of blood, closed and coded in the manner of my invention, is delivered to the patient's bedside. Patients admitted into hospitals are usually provided with bracelets of plastic material upon which the group, and other peculiarities, of their blood is marked in the form of code numbers. When the person, performing or assisting in performing the blood transfusion, receives the container of blood, he notes the code number of the patient's blood from his bracelet, say 8251, to continue in the hereinbefore used example. He then takes a suitable stylus, for instance his pencil, and breaks the bottom 35 of the depressions 34 in the side walls of the sheath 32 corresponding to the code numbers on the patient's bracelet, i.e. the eighth depression counting from the left row A, the second depression in row B, the fifth depression in row C and the first depression in row D. In doing so he pushes the pins 30 which he may encounter in the apertures 25 in the channel flanges through the frangible bottom membrane of the aligned depressions 34 in the opposite side wall of the sheath, out of the registering holes 25, 22. If the blood contained in the bottle was the proper blood for the patient to receive, the technician or nurse encountered a locking pin 30 below the floor 35 of everyone of the four depressions into which he inserted his stylus, and upon removal of the pins, the channel 23 with the sheath 32 wrapped around it, may readily be withdrawn from the end portions 20a and 20b of the strap. These strap end portions may then be pulled apart to permit removal of the lid 18 from the mouth of the bottle. However, if

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in breaking the bottoms 35 of the depressions 34 corresponding to the code number on the patient's bracelet, the nurse or technician does not encounter a pin, or if the sheath 32 and channel 23 cannot be removed from the end portions of the strap, and the strap, therefore, cannot be removed from the mouth of the bottle after the operator has perforated all four of the depressions corresponding to the code number on the patient's bracelet and believes to have ejected all four of the pins, then he is immediately warned that an error has occurred somewhere and that the blood in the container is not the blood compatible with the patient's constitution, and possible disaster is averted.

On the other hand, in case of a mistake, the perforated sheath 32 upon the withdrawn channel 23 constitutes a permanent record by which it can be determined whether the person administering the blood transfusion made a mistake or not. If the broken or punched depressions in the sheath agree with the code numbers on the patient's bracelet, it is obvious that what ever emergency arose it is not the fault of the person who administered the blood transfusion. It can only be the error of the persons who analyzed the administered blood and/or the persons who closed and/or coded the device for fastening the lid to the container.

While I have explained my invention with the aid of a particular embodiment thereof, it will be understood that the invention is not limited to the specific constructional details shown and described by way of example, which may be departed from without departing from the scope and spirit of the invention. In particular, while I have described my invention with repeated references to its utility in the closing of blood containers under coded conditions, it will be understood that it has utility in other fields, such as the bottling of poisons, pharmaceutical substances, and other chemical compounds. Also, while I have explained the invention as applied to the lid of a jar, it may be incorporated in closure straps employed to hold money bags, mail bags and like containers in closed condition.

I claim:

1. A codeable closure device for containers comprising a strap having end portions each provided with a plurality of apertures arranged to register with each other upon juxtaposition of said end portions, means for containing the juxtaposed strap end portions including side walls having a plurality of apertures adapted to be brought into registry with the apertures in said strap end portions, a number of pins adapted to fit into aligned apertures in said side walls and said strap end portions, and a sheath of perforable material adapted to be fitted over said side walls and said juxtaposed strap end portions.

2. A device according to claim 1 wherein said sheath has side walls containing a plurality of areas of reduced wall thickness adapted to be brought into registry with the apertures in the side walls of said containing means.

3. A device according to claim 1 including limit stop means on said strap end portions to locate said containing means relative to said strap end portions in a position wherein the apertures in the side walls of said containing means register with the apertures in said juxtaposed strap end portions.

4. A device according to claims 1 and 2 including snap lock means arranged between said sheath and the side walls of said containing means to lock said sheath relatively to said containing means in a position wherein said reduced areas in the side walls of said sheath register with the apertures in the side walls of said containing means.

5. A device according to claim 1 wherein said containing means is a U-shaped channel.

6. A device according to claims 1 and 2 wherein the apertures in the end portions of said strap, the apertures in the side walls of said containing means and the

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areas of reduced wall thickness in the side walls of said sheath are arranged in two juxtaposed sets of superposed rows each containing ten apertures and ten areas of reduced wall thickness, respectively.

7. A device according to claim 1 wherein the center portion of said strap between said apertured end portions thereof forms a shallow U-shaped channel.

8. A device according to claim 1 wherein said pins are of a length about equal to the total thickness of said juxtaposed strap end portions and the adjacent side walls of said containing means.

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