

[54] SAFETY CAP

[76] Inventor: Morton Stull, 221-223 Banta Ave.,
Garfield, N.J. 07026

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[58] Field of Search 215/9, 46 R, 41; 222/546,
222/153; 220/60

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Primary Examiner—George T. Hall

Attorney, Agent, or Firm—H. Gibner Lehmann; K.
Gibner Lehmann

[57] ABSTRACT

A safety cap construction comprising a pouring-spout

type fitment and a closure cap attachable to and removable from the fitment. The cap has a protruding finger piece by which a user can pry it off, using the fingers. The fitment has spaced-apart guard members disposed in a forward location, which straddle the finger piece of the cap when the latter is in place. The finger piece and the two guard members define a hypothetical arc which, due to the closeness and the positioning of the members, has a radius that is shorter than the radius of the arc defined generally by the front teeth of a human being, to the end that a person such as a small child cannot employ his teeth against the finger piece to force the cap off of the fitment. However, the spacing between the guard members is still great enough to admit a user's finger for access to the finger piece for the purpose of removing the cap from the fitment by finger pressure. The cap and fitment are permanently connected to each other by a thin flexible web which insures that the finger piece will always be urged to a central location between the guard members when the cap is being replaced on the fitment after use.

11 Claims, 9 Drawing Figures

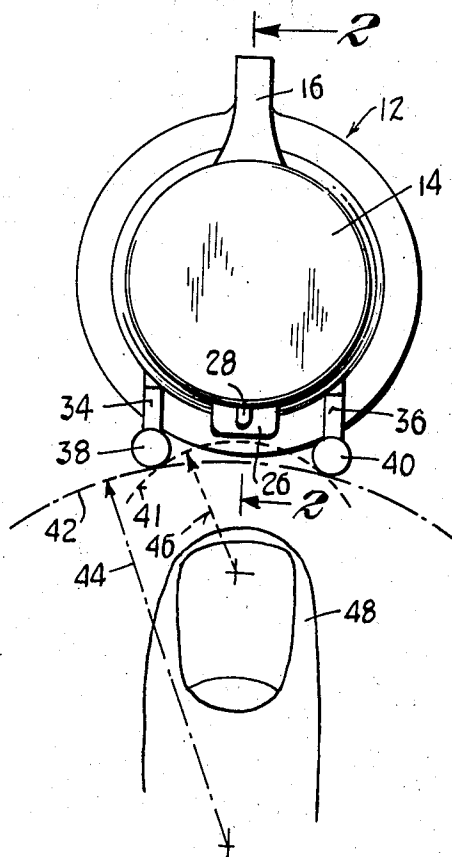


Fig. 1

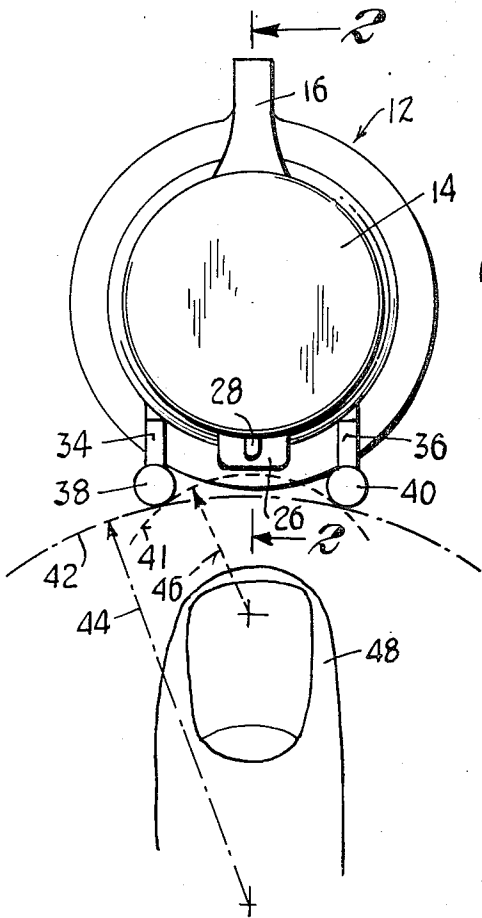


Fig. 2

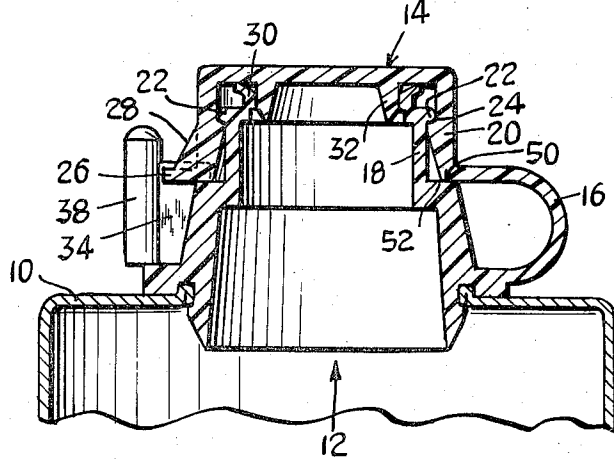


Fig. 3

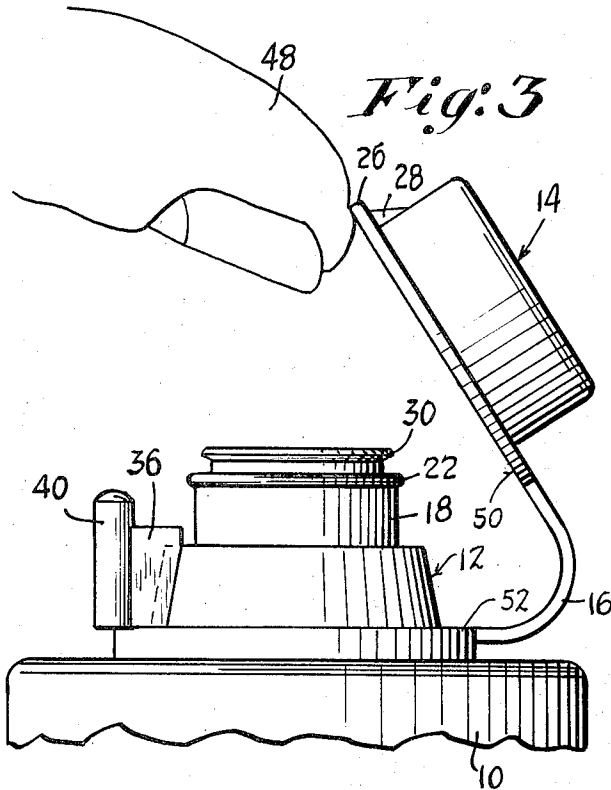


Fig. 4

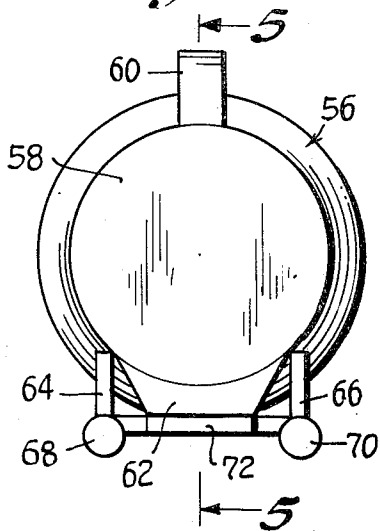


Fig. 5

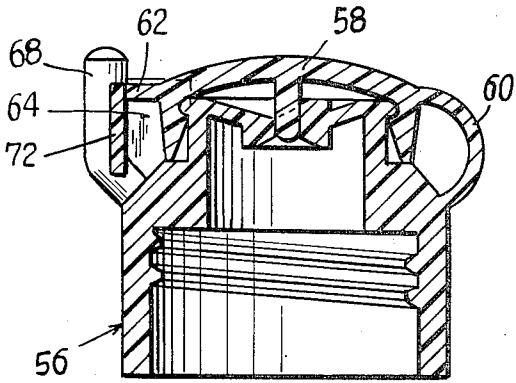


Fig. 6

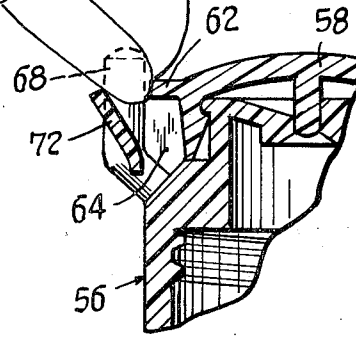


Fig. 7

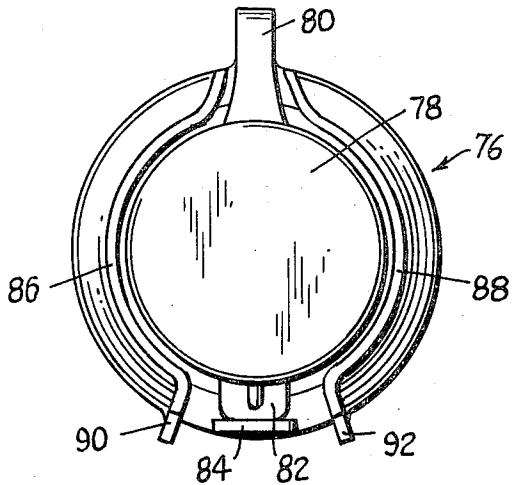


Fig. 8

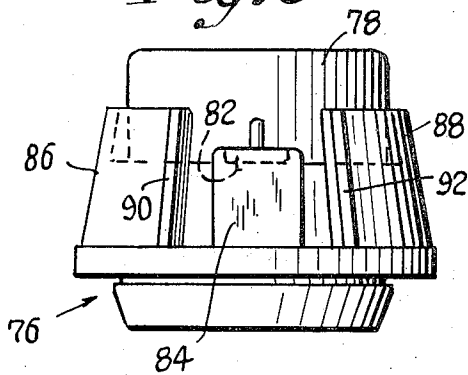
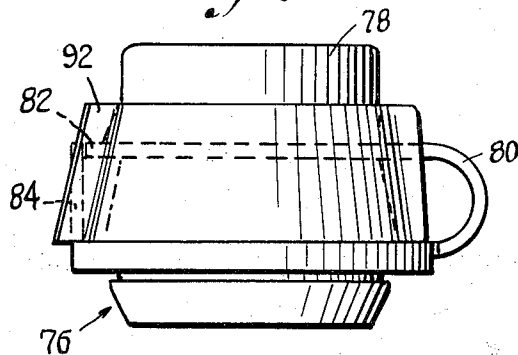


Fig. 9



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SAFETY CAP

CROSS REFERENCE TO RELATED APPLICATION

Co-pending application of Morton B. Stull, U.S. Ser. No. 284,430 filed Aug. 28, 1972 and entitled "Safety Cap," now U.S. Pat. No. 3,765,578.

BACKGROUND

This invention relates generally to safety closures for small dispensers, and more particularly to devices of this type which involve a pouring-spout type fitment part, and a closure cap part adapted to be frictionally held on the fitment part and to be removable therefrom in response to finger pressure.

In the past a number of different types of safety closures have been proposed and constructed. In some instances a closure cap was provided, having an internal tab which was cooperable with a discontinuous bead disposed on a bottle neck or cap body. To effect removal of the cap it had to be rotated to a particular position with respect to the body, whereby the tab was aligned with a notch or discontinuous area of the bead. Other types of prior closures involved a cap having an external lifting tab which, in its sealing or closed position, was in such close proximity to an external annular bead of the cap body that it could not be conveniently used to raise or remove the cap. There were no other protrusions on the cap, which were available for lifting the same. Thus the cap could not be removed until it was rotated with respect to the cap body so as to bring the lifting tab into registration with a cut or notched portion of the annular body bead. After this was done the tab could be readily engaged by a user's finger, so as to forcibly lift the cap off. In some cases marker arrows were disposed on the cap and cap body, to provide a user with an indication of the proper rotary position to which the cap had to be turned when it was desired to remove the same. While all of these prior constructions in general functioned satisfactorily, they had a number of distinct disadvantages. In some cases, the reassembly of the cap to the container was complicated, since the cap had to be oriented to a particular position in order to snap it on. After such operation the cap then had to be turned so as to bring it to the locking position or condition. If this last step was not carried out the cap would undesirably remain in an unlocked position whereby a child who inadvertently handled the container could readily snap it off (without having to resort to the initial unlocking movement). Thus the safety feature could be lost merely by careless reassembly of the cap. Further, many prior closure caps which were not of the captive type inevitably became lost or misplaced, which had the effect of completely defeating any safety aspects. In most prior closure caps the various measures that were utilized to prevent unauthorized removal were not sufficiently effective or adequate when the closure construction was subjected to a biting action, utilizing the teeth. Thus, a child if thwarted in his efforts to remove the cap by other or conventional means, would usually effect the removal by prying off the cap with his teeth. Since it is a perfectly natural thing for a child to use its teeth on objects, this constituted a serious drawback for caps which were otherwise adequately safeguarded with respect to removal by the use of the fingers.

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SUMMARY

The above disadvantages and drawbacks of prior safety, closure cap constructions are obviated by the present invention which has for its main object the provision of a novel and improved safety cap which, while being extremely simple in its construction, reliable in operation and low in cost, is to the maximum extent foolproof against unauthorized removal by the use of the teeth. A feature of the invention involves a safety cap as above characterized, wherein a closure or cap part which depends for its safety on proper orientation with respect to the spout or fitment part, is reliably guided during its reapplication thereby to attain its proper, safe position without special pains being taken on the part of the user. A related object of the invention is to provide an improved safety cap construction in accordance with the foregoing, which can be readily, conveniently opened by any authorized person, using only the fingers and without the necessity for previous instructions or special knowledge.

These objects are accomplished by a novel closure construction comprising a cap body or pouring-spout type fitment which is intended to be secured to a container, and a closure cap part which is attachable to and removable from the fitment, there being cooperable means for frictionally and releasably retaining the cap part in its closing position. The cap part has a protruding finger piece which enables a user to pry it off by use of the fingers, and the fitment has spaced-apart guard members which straddle the finger piece and are disposed generally forwardly thereof. The spacing and disposition of the guard members are such that they, in conjunction with the finger piece, define a hypothetical arc which has a radius shorter than the radius of the arc defined by the front teeth of a human being, whereby it is not possible for the teeth to be applied to or reach the finger piece due to the obstruction presented by the guard members. All accessible portions of the cap and fitment are made to be closely fitting, without intervening spaces, openings or projections and to present instead a generally smooth or flush exterior whereby it is not possible to obtain a grip on the cap by use of the teeth. However, the spacing between the guard members is great enough to admit a user's finger for access to the finger piece whereby the cap can be removed without difficulty and in the accustomed well-known manner, merely by applying sufficient force. The fitment and cap are permanently attached to each other by a flexible web which constitutes a hinge, enabling the cap to be swung away from the fitment for purposes of discharging the contents of the container. However, the web is so arranged that, upon reapplication of the cap to the fitment, the finger piece will always be properly centrally located with respect to the guard members. Thus the safety feature which prevents unauthorized removal of the cap will not be impaired, as by careless or thoughtless reclosing of the container.

The fitment, cap and hinge web are so arranged that they can be readily molded in a single operation, in simple mold cavities whereby the cost of producing the safety cap construction is held to an attractive, low figure.

Other features and advantages will hereinafter appear.

In the drawings illustrating several embodiment of the invention:

FIG. 1 is a top plan view of a dispensing cap construction made in accordance with the invention, the cap being located in its sealing or closing position on the fitment part.

FIG. 2 is an axial sectional view taken on the line of 2—2 of FIG. 1.

FIG. 3 is a side elevational view of the cap construction of FIGS. 1 and 2, illustrating the cap part in the raised position whereby the dispensing of the contents of the container can be effected.

FIG. 4 is a top plan view of another safety dispensing cap construction made in accordance with the invention, constituting another embodiment thereof.

FIG. 5 is a transverse or axial section, taken on the line 5—5 of FIG. 4.

FIG. 6 is a fragmentary sectional view illustrating the use of a finger in prying up the cap part of the closure construction of FIGS. 4 and 5.

FIG. 7 is a top plan view of another safety dispensing cap construction, constituting yet another embodiment of the invention. The cap part is in the sealing or closing position.

FIG. 8 is a front elevational view of the cap construction of FIG. 7, and

FIG. 9 is a side elevational view of the cap construction of FIGS. 7 and 8, with the cap part in the closed or sealing position.

Referring first to FIGS. 1—3, the present improved cap construction is shown as being carried by the upper portion of a container 10, said construction including a pouring-spout type fitment part generally designated by the numeral 12, and a closure cap part which is generally designated by the numeral 14. The fitment part 12 and cap part 14 are permanently joined to each other by a flexible tie or hinge web 16 which is made sufficiently short and relatively stiff so as to control and guide the cap part 14 when it is being applied, whereby such part always occupies essentially one definite rotative position, being oriented generally as illustrated in FIG. 1.

The cap part 14 is attachable to and removable from the fitment part 12 by virtue of a friction fit, said parts having cooperable means comprising a tubular lip portion 18 of the fitment part which is received in an annular depending wall 20 of the cap part. The tubular lip 18 preferably has an exterior retainer bead 22 which is received in an annular groove 24 provided in the inside of the wall 20.

The fitment and cap parts together with the web 16 are molded of plastic material such as polyethylene or the like, whereby these parts are resilient and flexible, being yieldable to enable a relatively effective detent action to be had by virtue of the bead 22 and groove 24, while at the same time permitting a user to remove the cap part 14 when this is desired. For such purpose the cap part 14 has a finger-engageable piece or tab 26 protruding from the wall 20 at a location opposite to that of the hinge web 16. A strengthening rib 28 on the finger piece 26 provides reinforcement and enables the latter to function as an effective lifting tab when finger pressure is applied to its underside. The fitment 12 can include an annular sealing bead 30, and the cap part 14 can have an annular depending flange 32 cooperable with the bead 30 whereby the mating surfaces provide an effective seal when the cap part is in the closed position illustrated in FIG. 2.

In accordance with the present invention the fitment part 12 is provided with a pair of spaced-apart guard members 34 and 36, said members including integral upstanding posts 38, 40 which straddle the finger piece 26 and are disposed forwardly thereof. The guard posts 38, 40 are so located and spaced from each other that, with the finger piece 26 they define a hypothetical arc which has a radius that is shorter than the radius of the arc defined by the front teeth of a human being. In FIG. 1 the arc defined by the guard members and finger piece is shown by a broken line, being designated 41. The arc represented by the front teeth of a human being is designated by the broken line 42, such arc having a long radius 44 whereas the arc 41 has a much shorter radius 46.

It will be readily apparent from an inspection of FIG. 1, that the front teeth of a person, as represented by the arc 42, will be prevented by the guard members 38 and 40 from reaching the finger piece 26. Thus, the teeth of a child, for example, would not be able to engage the finger piece 26 so as to force the cap part 14 off of the fitment part 12. Further, as provided by the invention, the guard members 38, 40 are spaced apart a sufficient distance to enable the finger of a user, designated 48 in FIG. 1, to be inserted between them and to engage the lifting tab or finger piece 26 so as to force or pry upward the cap part 14 and remove it from the fitment part 12 as illustrated in FIG. 3.

As previously mentioned, the hinge web 16 is so constituted that, upon reapplying the cap part 14 to the fitment part 12, the finger piece 26 will always be disposed generally centrally between the upright posts 38 and 40 comprising the guard members, as illustrated in FIG. 1. Referring to FIG. 2 it will be seen that the bottom edge or surface 50 of the cap part 14 tightly engages an annular, upwardly facing shoulder 52 of the fitment part, with no space between these parts. The exterior surfaces of the cap and fitment parts, except at the hinge web 16 and finger piece 26, are flush with each other, and accordingly it is not possible for a child to effectively grip the cap part 14 with the teeth and to remove the cap part in this manner.

Another embodiment of the invention as illustrated in FIGS. 4, 5 and 6. In these figures a pouring-spout fitment part 56 carries a closure cap part 58, these parts being joined by a flexible hinge web 60. The cap part 58 has a finger piece 62 which is relatively wide as compared with the finger piece 26 of FIGS. 1—3, and is disposed between a pair of guard members 64, 66 including upstanding post portions 68, 70. The guard members 64, 66 are carried by the fitment part 56. Extending between the guard members 64, 66 is a cover piece or tab 72 in the form of a thin, upright slab the upper portion of which engages the free edge of the finger piece 62, said tab thereby preventing access to the front edge and underside of the finger piece.

As with the embodiment of FIGS. 1—3, the guard members 68, 70 are so spaced from each other, and the finger piece 62 is so disposed a sufficient distance at the rear of the guard members so that, even in the absence of the cover tab 72 it would not be possible for teeth to be applied to the finger piece to lift the cap part 58 from the fitment part 56. However, the protection afforded by the tab 72 provides additional assurance that a child's teeth will not be able to reach the tab 62 if it attempts to remove the cap.

For the purpose of lifting the cap part 58 from the fitment part 56, the user (an authorized person) merely shifts forwardly the protective tab 72 and thereafter inserts a finger nail under the lifting tab 62, all as illustrated in FIG. 6. Due to the yielding nature of the polyethylene plastic, the protective tab 72 can be sprung away in this manner without resulting in its being torn from its anchorages comprising the guard members 64, 66. The embodiment of FIGS. 4-6 thus provides an added safeguard against unauthorized removal of the cap part, by the provision of the additional protective tab 72 which normally prevents all access to the underside of the finger piece 62 unless it is twisted out of position in the manner illustrated in FIG. 6.

With the embodiments of FIGS. 1-3 and FIGS. 4-6 the application of the teeth to side portions of the cap part will result in the latter becoming more securely attached to the fitment part for the reason that the side walls of the cap part will be forced inward as the cap construction yields slightly under the force of the teeth. This will result in the detent bead and detent groove of the spout fitment and cap part becoming more tightly engaged with each other, whereby they more stoutly resist separation of the cap part from the fitment part.

Yet another embodiment of the invention is illustrated in FIGS. 7-9, wherein a pouring-spout type fitment part 76 frictionally carries a cap part 78, these parts being connected by a flexible hinge web 80. The cap part 78 has a finger piece 82, and the fitment part 76 has a guard tab 84, functioning in general similar to the parts 62, 72 of FIGS. 4-6. Additionally, the fitment part 76 has a pair of upstanding, curved semi-circular flanges 86, 88 which extend from the vicinity of the hinge web 80 forwardly to locations closely adjacent the finger piece 82 and protective tab 84. At these forward locations the flanges 86, 88 have turned-out portions or extremities 90, 92 which constitute guard members in the manner explained above in connection with FIGS. 1-6. Also, the side flanges 86, 88 prevent access from being had to side portions of the cap and spout parts where these meet each other and where a tight-fitting crack exists. The flanges 86, 88 thus prevent application of the teeth to the lower portions of the cap part 78, thus positively precluding any likelihood of the cap part being forced off of the fitment part in an unauthorized manner, using the teeth.

It will now be seen from the foregoing that I have provided a novel and improved safety dispensing cap construction wherein there is defeated any possibility of removal of the cap part from the fitment part in an unauthorized manner, as by the use of the teeth. At the same time, the cap part can be easily and quickly removed in the usual or conventional manner by the application of a finger at the proper location, by an authorized user. The cap construction is especially simple in its structure, and the entire construction can be easily, quickly and economically molded in a single operation, in simple mold cavities whereby the fabrication cost is held to a minimum while at the same time there is had a desirable safety factor.

Variations and modifications are possible without departing from the spirit of the invention.

I claim:

1. A safety dispensing cap construction comprising, in combination:

- a. a pouring-spout fitment part having means for securing it to a container,
 - b. a closure cap part attachable to and removable from the fitment part, said parts having cooperable means for frictionally releasably retaining the cap part on the fitment part,
 - c. said cap part having a protruding finger piece to enable a user to pry it from the fitment part by use of a finger,
 - d. said fitment part having spaced-apart guard members straddling said finger piece and disposed forwardly thereof,
 - e. said finger piece and guard members defining a hypothetical arc having a radius which is shorter than the radius of the arc defined by the front teeth of a human whereby said teeth are prevented by the guard members from reaching the finger piece to apply force thereto,
 - f. the spacing between said guard members being great enough to admit a finger for access to the finger piece.
2. A cap construction as in claim 1, and further including:
- a. a flexible hinge web connecting the fitment and cap parts, controlling movement of the cap part to insure proper replacement of the finger piece thereof between the guard members as the cap part is applied to the fitment part.
3. A cap construction as in claim 2, wherein:
- a. the guard members are disposed on opposite sides of a plane passing through said finger piece and flexible hinge web.
4. A cap construction as in claim 1, wherein:
- a. the guard members comprise upright posts extending both above and below the horizontal plane containing the finger piece.
5. A cap construction as in claim 1, and further including:
- a. a protective tab carried by the fitment part at a location between the guard members,
 - b. said tab covering the free edge of the finger piece.
6. A cap construction as in claim 5, and further including:
- a. a pair of upstanding curved flanges on the fitment part, covering the joint between the latter and the cap part at both sides of the protective tab, thereby to prevent access to said joint.
7. A cap construction as in claim 6, wherein:
- a. ends of said flanges adjacent and on opposite sides of the finger piece are reversely curved and extend away from the finger piece, said ends constituting the said guard members.
8. A cap construction as in claim 7, and further including:
- a. a flexible hinge web connecting the fitment and cap parts, controlling movement of the cap part to insure proper replacement of the finger piece thereof between the guard members as the cap part is applied to the fitment part,
 - b. the remaining ends of said flanges extending closely adjacent said hinge web and constituting a guide therefor so as to aid in the proper orientation of the cap part during its replacement on the fitment part.
9. A cap construction as in claim 5, wherein:

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- a. the protective tab is resilient and adapted to be flexed away from the finger piece to provide access to the latter.
- 10. A cap construction as in claim 9, wherein:
 - a. the guard members comprise upright posts to which the protective tab is attached.
- 11. A cap construction as in claim 1, and further in-

- cluding:
- a. flange means on said fitment part, extending upward therefrom and covering the joint between the cap and fitment parts, thereby to prevent access to said joint.
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