

[54] **CLASP FOR BRACELETS AND THE LIKE**

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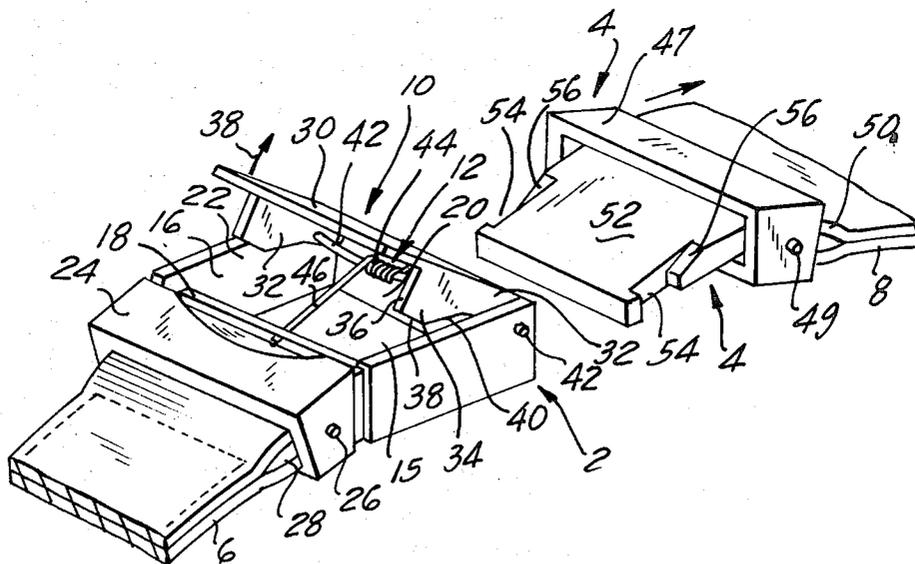
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[57] **ABSTRACT**

A clasp for securing together two objects, such as the two ends of a bracelet, comprises a housing and a connecting element adapted to be slid into the housing. The housing carries a catch which engages with the connecting element to retain the latter in the housing. The act of releasing the catch cams the connecting element outwardly from its connected position, the connecting element nevertheless being frictionally retained within the housing, from which it can be separated by a subsequent and separate action.

15 Claims, 7 Drawing Figures



CLASP FOR BRACELETS AND THE LIKE

The present invention relates to the construction of a clasp for releasably securing together two objects, such as the ends of a bracelet.

Clasps of the type in question, particularly when they are used in connection with valuable objects, such as gemmed bracelets and expensive watches, must be extremely reliable in operation. When the clasp is engaged the two objects with which it cooperates (hereinafter, being termed "bracelet ends," because the clasp is exceptionally well adapted to secure together the ends of a bracelet) must be reliably connected together. If that is not the case and if for some reason the two bracelet ends should become separated accidentally, the bracelet will fall from the wrist of the wearer. If, as it happens all too often, this occurs when the attention of the wearer is otherwise directed the bracelet (together with the watch if it is a watch-bracelet which is being worn) will be lost.

Many clasps function very reliably if not disturbed. However, when a bracelet is worn it is subject to many disturbances. It may be jarred if the wearer's arm hits against a wall or a desk. The movable catch element on the clasp may be engaged and moved as the wearer's arm swings against his body, is drawn out from a pocket of his clothes, or slides across a chair cushion, for example. The clasp must be so designed as to guard against all of these effects.

Another problem involved in the functioning of clasps, particularly for jewelry items such as bracelets, is that the wearer must find it easy to determine when the clasp is properly engaged. If that is not the case the wearer may think that his piece of jewelry is properly secured, whereas in fact it may not be. The consequences may be serious.

Another requirement for clasps of the type under discussion is that they can be easily engaged and disengaged, preferably by one-hand operation. This is particularly important in connection with jewelry items worn on the arm or wrist, since then only one of the wearer's hands is available for manipulation of the clasp. A particular problem in this category arises when the clasp is being disengaged. When the only available hand of the wearer is manipulating the catch part of the clasp to disengaging position, and if that manipulation succeeds in disengaging the two parts of the clasp, the premature separation of these two parts may result in damage or injury to the item of jewelry associated with the clasp. For example, if the two parts of the clasp separate too readily while the only available hand of the user is actuating the catch the jewelry item may slip from the wrist of the wearer and from his grasp and fall to the ground.

It is a prime object of the present invention to devise a clasp structure which avoids all of the above disadvantages.

More particularly, it is an object of the present invention to devise a clasp which lends itself to attractive design so that it may be utilized with artistic items in jewelry, which may be manufactured relatively inexpensively and without requiring any great degree of precision, and which at the same time will produce a clasp structure which is easily locked and unlocked which will readily apprise the user of its locked or unlocked status, and which when unlocked will nevertheless tend to remain engaged, requiring for effective disengagement a subsequent separate operation, thereby making most remote the possibility of damage to the item of jewelry during disengagement.

To these ends, the clasp comprises a housing defining one clasp part, that housing having an open end through which a connecting element defining the other clasp part is adapted to be slid to locking position. A catch is mounted on the housing and is movable between locking and releasing positions. The catch and the connecting element are provided with cooperating parts, such as a projection on the catch and a recess on the connecting element, which engage only when the connecting element is in its fully inserted position and the catch is in its locking position. If the connecting element is not in its fully inserted position the catch will not be able to move to its locking position, this will be obvious to the user, and thus the user will know that the clasp is not properly engaged.

When the clasp is properly engaged, when the cooperating parts on the catch and the connecting element operatively cooperate with one another to lock the connecting element in the housing, that connecting element will have a section located outside and adjacent to the housing, and the catch will have a member operatively connected thereto which, when the catch moves from its locking to its releasing position, engages the aforesaid section of the connecting element and moves it away from the housing, thereby partially withdrawing the connecting element from the housing. When the catch is then released it cannot return to its locking position, being prevented by the connecting element in its then position, and hence the user will be apprised of the fact that the clasp is not locked. At the same time, in order to prevent premature separation of the two clasp parts, that portion of the connecting element remaining within the housing is frictionally engaged, as by a spring which urges it against an appropriately oriented housing surface. Thus the clasp parts will remain together and the bracelet will not fall from the wearer's wrist. Thereafter the user need merely pull the connecting element out from the housing against the frictional resistance after he has firmly grasped that connecting part and the bracelet end to which it is secured. The frictional action on the connecting element retaining it within the housing may be supplemented by a detent action when desired.

To the accomplishment of the above and to such other objects as may hereinafter appear, the present invention relates to the construction of a clasp as defined in the appended claims and as described in this specification, taken together with the accompanying drawings, in which:

FIG. 1 is a three-quarter perspective view of a preferred embodiment of the present invention showing the clasp in locked condition with the catch in locking position;

FIG. 2 is a view similar to FIG. 1, but partially broken away, showing the housing and connecting element separated from one another and the catch on the housing in its releasing position;

FIG. 3 is a cross-sectional view on a reduced scale taken along the line 3—3 of FIG. 1;

FIG. 4 is a view similar to FIG. 3 but showing the catch in its releasing position and camming the connecting element partially out from the housing;

FIG. 5 is a cross-sectional view taken along the line 5—5 of FIG. 3;

FIG. 6 is a cross-sectional view of another embodiment of the present invention taken along a line extending longitudinally of the clasp substantially midway of its width; and

FIG. 7 is a three-quarter perspective view showing the clasp of FIG. 6 with the housing and connecting element separated and with the catch in its releasing position.

The clasp as here disclosed, for purposes of illustration, secures together the two ends of a bracelet or strap such as might be used to encircle the wrist of a person and to carry a wrist watch and/or ornamentation, but it will be understood that this is by way of exemplification only, and that the clasp can be used for connecting together any two objects.

The clasp comprises two main parts, a housing generally designated 2 and a connecting element generally designated 4, those two parts being adapted to be releasably locked together and separated. The housing 2 is adapted to be secured to an object, such as the bracelet end 6, and the connecting element 4 is adapted to be secured to another object, such as the other end 8 of a bracelet. The connecting element is adapted to be inserted into and removed from the housing 2, that housing carrying a catch 10 which is movable between locking and releasing positions shown respectively in FIGS. 1 and 2. When the catch 10 is in its locking position and when the connecting element 4 is fully inserted into the housing 2, the catch 10 engages with the connecting element 4 and locks it in position. When the catch 10 is in its releasing position it is disengaged from the connecting element 4, thus permitting the latter to be removed from the housing 2. Also located in the housing is a member 12 which is adapted to engage the connecting element 4 when it is inserted in the housing and to cause that ele-

ment to be frictionally retained within the housing, thereby inhibiting separation of the connecting element 4 from the housing 2 even when the clasp is unlocked but permitting that separation to be accomplished through an appropriate affirmative action on the part of the user. The catch 10 is provided with a member 14 which, as the catch 10 is moved from its locking position shown in FIG. 1 to its releasing position shown in FIGS. 2 and 4, engages the connecting element 4 and cams it outwardly to a position still substantially within the housing 2 but sufficiently removed from its locking position so that the catch 10 can no longer lockingly engage therewith. Release of the catch 10 after it has thus cammed the connecting element 4 to its position shown in FIGS. 2 and 4 then results in interference between the catch 10 and the connecting element 4, preventing the former from attaining its locking position. This will have two effects: first, the position which the catch 10 assumes will alert the user to the fact that the clasp is not locked, so that he can take appropriate action if desired or appropriate, and second, the fact that the connecting element is not locked in position will permit the user to withdraw it from the housing 2 provided that it is pulled with sufficient force to overcome the frictional resistance to movement caused by the part 12.

The housing 2 comprises a bottom wall 15, side walls 16, and a rear wall 18. It is open at its front end 20 and at its top 22. Secured to the rear wall 18 is a shell part 24 within which a portion of the object 6 is adapted to be received and secured, as by means of the pin 26 passing through the loop 28 formed in the bracelet end 6.

The catch 10 comprises a top wall 30 and depending side walls 32 the ends 34 of which are enlarged vertically and are provided with front edges 36, bottom edges 38 and inclined rear edges 40. A pin 42 extends between the side walls 16 adjacent but somewhat inwardly spaced from the open housing end 20, and the catch 10 is pivotably mounted on that pin 42, the pin passing through appropriately positioned apertures in the side walls 32 of the catch 10. A portion of the catch 10 extends forwardly to the right beyond the pin 42, as may best be seen from FIGS. 3 and 4, that portion being integral with the catch 10 and constituting the part 14. The catch 10 is movable between a locking position shown in FIGS. 1 and 3, in which its top wall 30 is received between the side wall 16 of the housing, and a releasing position shown in FIGS. 2 and 4 in which the top wall 30 extends up from the housing side walls 16, as shown in FIGS. 2 and 4. Means are provided resiliently urging the catch 10 to its locking position, that means being here shown as a spring 44 coiled about the pin 42, having one arm 46 extending forwardly to and anchored in the wall 18 and having another arm 48 engaging the inner surface of the catch 10 to the right of the pin 42, as viewed in the figures, thereby urging the catch 10 to pivot in a counterclockwise direction as viewed in the figures.

The connecting element 4 comprises a shell-like part 47 to which an end of the object 8 is adapted to be secured in any appropriate manner, as by means of the pin 49 passing through the loop 50 formed in the bracelet end 8. Extending forwardly from the shell part 46 is a plate-like section 52 provided with recesses 54 located at its sides and close to its leading end, with inclined surfaces 56 extending from the upper surface of the section 52 downwardly toward the recesses 54. The inclination of the surfaces 56 may be comparable to the inclination of the surfaces 40 on the catch 10, and the location of the recesses 54 on the connecting element 4 will be such as to register with and lockingly receive the enlarged side wall portions 34 of the catch 10 when the connecting element section 52 has been inserted into the housing 2 via the open end 20 thereof a proper distance and when the catch 10 is permitted to move to its locking position. This is illustrated in FIG. 3, where it will be noted that the engagement between the inclined surfaces 40 and 56 on the catch 10 and connecting element 4 respectively will tend to cam the connecting element 4 outwardly (to the right as viewed in the figures) so as to bring the forward end of the recesses 54 into engagement

with the surfaces 36 of the catch parts 34, thus taking up play in the clasp when it is locked.

When the connecting element 4 is in its fully inserted position, in which its recesses 54 register with the catch parts 34, the shell portion 47 of the connecting element 4 constitutes a section thereof which is located outside but close to the housing 2. As may be seen from a comparison of FIGS. 3 and 4, lifting of the catch 10 from its locking position to its releasing position, by causing it to pivot in a direction of the arrow 58, will cause that portion 14 of the catch 10 located to the right of the pin 42 to engage and push that section 47 of the connecting element 4, thereby camming the connecting element 4 somewhat outwardly from the housing 2. Upon subsequent release of the catch 10 the spring 44 will pivot the catch 10 in a counterclockwise direction back toward its locking position, but because the connecting element 4 has been thus cammed outwardly the catch parts 34 will no longer register with the connecting element recesses 54. Instead, those catch parts will engage the upper surfaces of the leading portion of the connecting element 4. The catch 10 will thus be retained in an elevated position, not flush with or received within the housing 2 (as it is in its locking position illustrated in FIG. 1) but projecting somewhat above the housing 2. This will give immediate warning or notice to the user that the catch is not locked, and permit him to take such action as is appropriate.

As may best be seen from FIG. 5, the pin 42 is curved downwardly between the side wall 16 so that it (or, as here specifically disclosed, the spring 44 carried by it) will be relatively closely spaced with respect to the upper surface of the bottom wall 14 of the housing 2. The connecting element section 52, when it enters the housing 2 via the open end 20 thereof, slides between the pin 42 and the bottom wall 15 and is engaged and pressed by the pin 42 into firm frictional engagement with the bottom wall 15. The pressure of the pin 42 on the connecting element section 52 (which preferably is a resilient pressure, deriving from the resiliency of the pin 42, for example) provides a supplemental clasp action which retains the connecting element section 52 within the housing 2 frictionally even though the locking action of the catch 10 is no longer effective. This will prevent the connecting element 4 from falling out from the housing 2, but it will not prevent it from being pulled out therefrom. This is an important functional feature.

In use, when the clasp parts are to be connected the connecting element section 52 is slid into the housing 2 via the open end 20 thereof. Its leading edge will engage the inclined surfaces 40 on the catch 10 and cam the catch upwardly against the action of the spring 44. When the connecting element 4 is fully inserted into the housing 2 the catch parts 34 will register with and snap into the connecting element recesses 54, thereby locking the connecting element 4 within the housing 2, and the cooperative action of inclined surfaces 40 and 56 will cause the front ends of the recesses 54 to engage the front surfaces 36 of the catch parts 34, thus taking up any looseness or play in the catch without requiring the parts to be highly dimensionally precise.

When the clasp is to be disengaged the catch 10 is lifted to its releasing position, as shown in FIGS. 2 and 4. When this is done engagement between the part 14 and the connecting element section 47 cams the connecting element 4 slightly outwardly from its locked position, that movement being permitted by withdrawal of the catch parts 34 from the connecting element recesses 54. When the catch 10 is released it cannot move back all the way to its catching position but will remain projecting somewhat upwardly from the housing 2, thus apprising the user that the catch is not locked. However, the resilient clasp action of the pin 42 retains the connecting element 4 within the housing 2, although in an unlocked position. This will retain the bracelet on the wrist of the wearer while he shifts his grasp from the catch 10, which can only be grasped by a fingernail, to the section 46 of the connecting element 4, which can be firmly grasped by the user's fingers. Thereafter the user pulls the connecting element 4

from the housing 2, but because he now has a firm grasp on the connecting element section 46, the bracelet will not fall.

The embodiment of FIGS. 6 and 7 is similar to that of FIGS. 1-5, and similar parts are identified by similar reference numbers. The embodiment of FIGS. 6 and 7 differs from that of the earlier embodiment in the manner in which the connecting element 4 is retained within the housing 2 after it has been unlocked and cammed outwardly from its locking position. In the embodiment of FIGS. 6 and 7 the pin 42' on which the catch 10 is pivotably mounted is straight rather than being bent downwardly, and the connecting element section 52, as it slides over the bottom wall 15 of the housing 2, has a clearance between itself and the pin 42'. A spring 44 is mounted on the pin 42' and, as in the earlier described embodiment, acts on the catch 10 to bias it toward its catching position. In the embodiment of FIGS. 6 and 7, however the spring arm 46' which is anchored in the end wall 18 of the housing 2 is itself bent downwardly so as to engage the upper surface of the connecting element section 52 when the latter is inserted into the housing 2, thereby to urge the latter down against the housing wall 15. The spring arm 46' may be provided with an integral protrusion 46A to engage the upper surface of the connecting element section 52. Additionally, if desired, a recess 46B may be formed in the upper surface of the connecting element section 52 at a position such as to register with the spring arm projection 46A, and to receive the latter therewithin, when the connecting element 4 has been cammed outwardly by the catch part 14. This engagement will produce a detent action which will more reliably retain the connecting element 4 within the housing 2 even though it is unlocked but which will yield to a firm pull exerted on the connecting element 4. In addition, the movement of the protrusion 46A into the recess 46B may assist in camming the connecting element 4 outwardly to its frictionally held but unlocked position.

While the spring active on the connecting element 4 is here shown as part of the spring 44 which also biases the catch 10 (FIGS. 6 and 7) or as part of the pin 42 on which the catch 10 is pivotably mounted (FIGS. 1-5), that is not essential. A separate spring could be provided for this purpose, e.g. a leaf spring arm mounted on and extending to the right from the front housing wall 18.

It will be apparent from the above that the catch of the present invention may be formed of simple and sturdy parts, that the parts are so designed as to cooperate and to minimize looseness or play even though they are not made to any high degree of dimensional precision, that the construction lends itself to incorporation into attractive ornamental designs suitable for use with expensive and artistic pieces of jewelry, and that the parts may be readily assembled. Moreover, the locking action is firm and positive, the manipulation of the clasp for unlocking is simple, the movement of the catch to its unlocking position positively insures that the connecting element moves out of its locked position, but the connecting element is nevertheless temporarily retained in the housing until the user can shift his grasp and thus be ready for separation of the clasp parts without endangering the objects to which those parts are connected.

While but a limited number of embodiments of the present invention have been here specifically disclosed, it will be apparent that many variations may be made therein, all within the scope of the invention as defined in the following claims.

I claim:

1. A clasp for releasably securing together two objects comprising a housing adapted to be secured to one of said objects and open at an end, a connecting element adapted to be secured to the other of said objects, said connecting element being movable into said housing via said open end thereof to a first position, a catch mounted on said housing and movable between locking and releasing positions, said catch and said element having cooperating parts which engage when said catch is in said locking position and said element is in said first position, thereby to retain said element in said first position in

said housing, and which disengage when said catch is in said releasing position, thereby to release said element for movement out from said housing, and a member operatively connected to said catch, movable therewith in a direction having a component away from said one end of said housing, and engageable with said connecting element as it thus moves, thereby to cam said connecting element outwardly of said first position to a second position when said catch moves from locking to releasing position.

2. The clasp of claim 1, in which said catch is mounted on said housing to pivot about an axis near said open end of said housing, said catch extending from said axis in a direction away from said open housing end, and said member is located on the side of said axis toward said open housing end.

3. The clasp of claim 1, in which said parts on said catch and element engage only when said element is in said first position, said parts not engaging when said element is in said second position.

4. In the clasp of claim 3, cooperating detent means on said housing and said connecting element engageable when said element is in said second position.

5. In the clasp of claim 1, cooperating detent means on said housing and said connecting element.

6. In the clasp of claim 1, cooperating detent means on said housing and said connecting element engageable when said element is in said second position.

7. The clasp of claim 1, in which said housing has a surface extending in a general direction from one housing end toward the other, said connecting element engaging and sliding over said surface as it is moved into said housing, and means on said housing engaging said connecting element and effective to urge it against said surface, thereby to inhibit escape of said connecting element from said housing.

8. In the clasp of claim 7, a shaft in said housing on which said catch is pivotably mounted, said shaft being located opposite said housing surface, said connecting element being located in said housing between said shaft and said surface, said shaft having a part operatively engaging said connecting element and urging it toward said surface, thereby to comprise said urging means.

9. In the clasp of claim 7, spring means operatively connected to said catch and effective to urge said catch to one of its said positions, said spring being located opposite said housing surface, said connecting element being located in said housing between said spring means and said surface, said spring means engaging said connecting element and urging it toward said surface, thereby to comprise said urging means.

10. The clasp of claim 1, in which said cooperating parts on said catch and said connecting element comprise surfaces which meet along a line inclined relative to the direction of insertion of said connecting element into said housing.

11. The clasp of claim 1, in which said cooperating parts on said catch and said connecting element comprise surfaces which meet along a line inclined relative to the direction of insertion of said connecting element into said housing in such a direction as to tend to cam said connecting element so that other portions of said cooperating parts move into engagement with one another.

12. A clasp for releasably securing together two objects comprising a housing adapted to be secured to one of said objects and open at an end, a connecting element adapted to be secured to the other of said objects, said housing having a surface extending in a general direction from one housing end toward the other, said connecting element being movable into said housing via said open end thereof and engaging and sliding over said surface as it is moved into said housing to a first position, a catch mounted on said housing opposite said surface and movable toward and away from said surface between locking and releasing positions respectively, said catch and said element having cooperating parts which engage when said catch is in said locking position and said element is in said first position, thereby to retain said element in said first position in said housing, and which disengage when said catch is in said

releasing position, thereby to release said element for removal from said housing, and means in said housing other than said catch located between said housing and said catch and on the opposite side of said element from said surface engaging said element and effective to urge it against said surface, thereby to inhibit escape of said element from said housing.

13. In the clasp of claim 12, a shaft in said housing on which said catch is pivotably mounted, said shaft being located opposite said housing surface, said connecting element being located in said housing between said shaft and said surface, said shaft having a part operatively engaging said connecting element and urging it toward said surface, thereby to comprise

said urging means.

14. The clasp of claim 13, in which said shaft carries spring means operatively connected to said catch and effective to urge said catch to one of its said positions.

5 15. In the clasp of claim 12, spring means operatively connected to said catch and effective to urge said catch to one of its said positions, said spring being located opposite said housing surface, said connecting element being located in said housing between said spring means and said surface, said 10 spring means engaging said connecting element and urging it toward said surface, thereby to comprise said urging means.

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