

Oct. 14, 1969

F. G. RINECKER
SIGNALING DEVICE

3,472,198

Filed Feb. 8, 1968

2 Sheets-Sheet 1

FIG. 1

FIG. 2

FIG. 3

FIG. 4

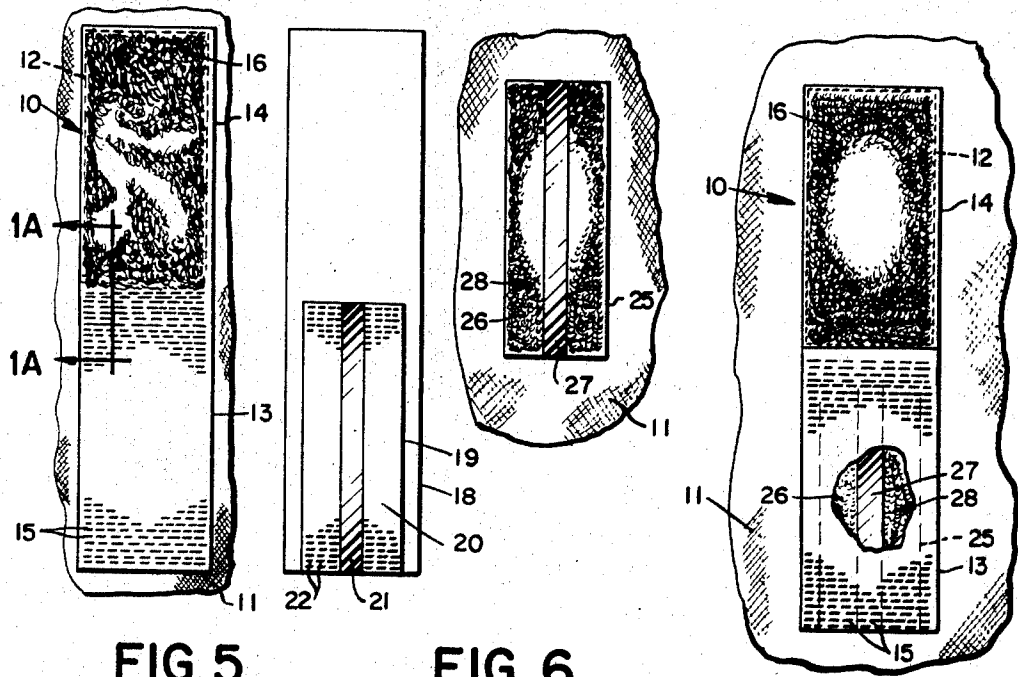


FIG. 5

FIG. 6

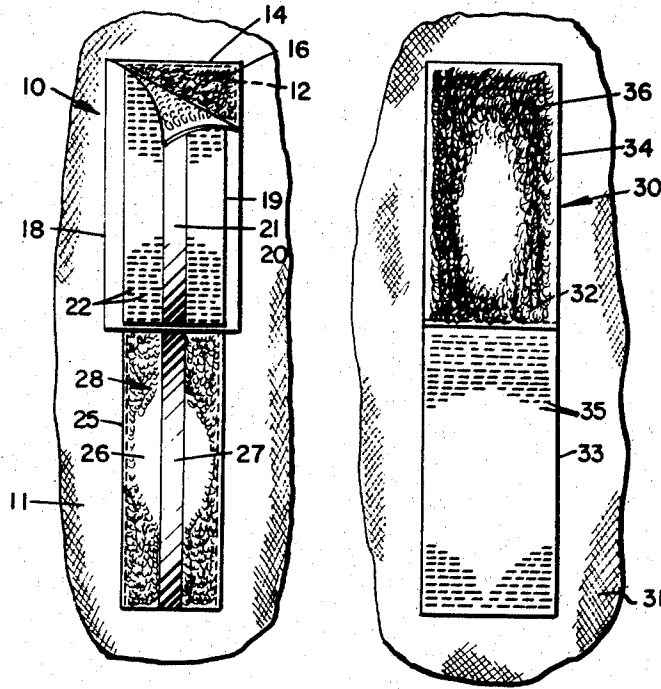
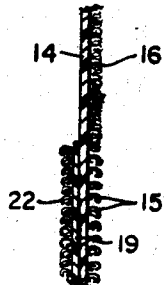


FIG. 1A



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FIG. 7

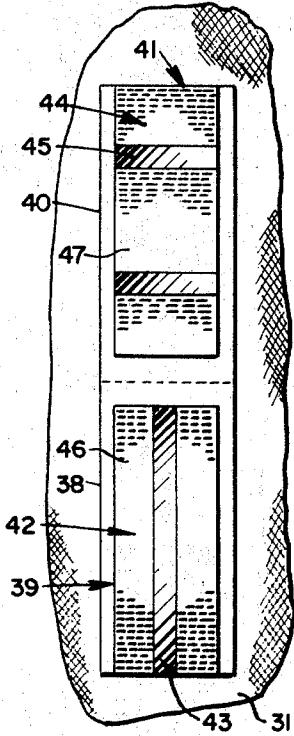


FIG. 8

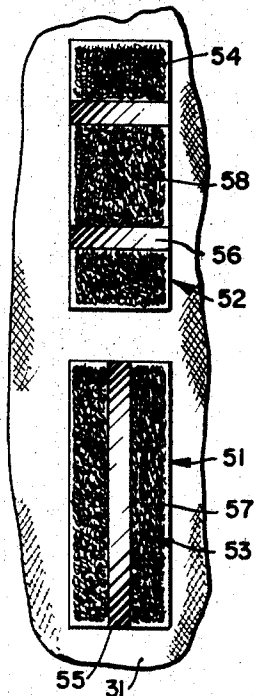


FIG. 9

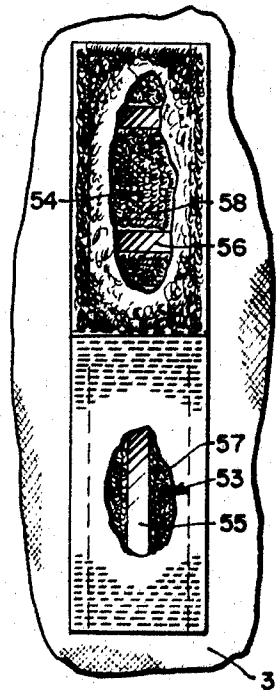


FIG 9A

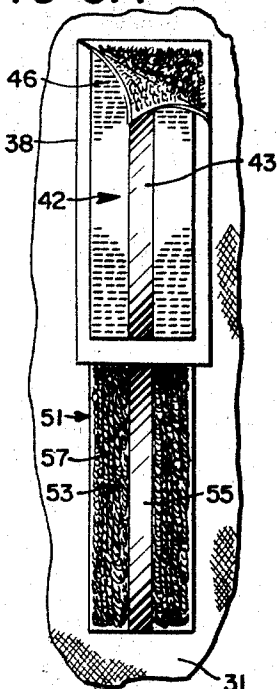
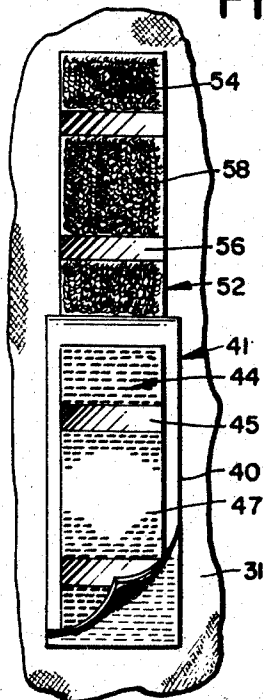


FIG. 9B



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SIGNALING DEVICE

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Filed Feb. 8, 1968, Ser. No. 703,925
Int. Cl. G01d 21/00

U.S. Cl. 116—114

5 Claims

ABSTRACT OF THE DISCLOSURE

A signaling device particularly suitable for use by the military wherein at least one indicator having a day-time-visible portion and a nighttime-visible portion is secured to an article of clothing, the color of the day-time-visible portion and the configuration of the nighttime-visible portion representing a signal which will be visible from a distance. A second member is secured to the article of clothing directly over the indicator. The second member may be adjusted either to cover each indicator or to expose it, the second member being retained in the desired position by hook and loop fasteners.

BACKGROUND OF THE INVENTION

This invention relates to a signaling device to be worn on an article of clothing or equipment. More particularly, this invention relates to a signaling apparatus for use by foot soldiers to indicate to air support units the need for supplies or ammunition.

The conduct of modern warfare requires that ground troops be adequately and continually supplied with ammunition, food and other necessary items. Such supplies are most conveniently and expeditiously brought in directly by helicopter or dropped by parachute from fixed wing aircraft. However, when ground troops are spread out from their base of operations or are out of radio contact, it is difficult for them clearly to inform their air support of the particular supplies required without either giving away their position or consuming too much time. Portable signaling means such as heliograph or semaphore are suitable in some instances but have certain drawbacks. Both are operable only during daylight hours and heliographs only when sunlight is available; both require special training to operate; and both require the full attention of the sender during operation. Other portable signaling means such as flares are operable at night but have the disadvantage of revealing the sender's position not only to the air support but also to the enemy. In addition, the prior art signaling apparatus is more complex in operation than it need be because a small number of signals will suffice under the present circumstances.

A signaling device which can indicate the need for ammunition, food or medical supplies, which is operable during daytime and nighttime and which may be conveniently carried and operated by a foot soldier having no specialized training in communications would be particularly suitable for the purposes of modern warfare. However, no such equipment is presently available.

SUMMARY OF THE INVENTION

The signaling device of the present invention may be worn on an article of clothing and includes a first fabric member secured to the article of clothing. The first member has first and second surfaces, each surface being divided into first and second portions. The first portion of the first surface defines a plurality of upstanding hooking elements of flexible resilient material and the second portion of the first surface defines a plurality of upstanding complementary hooking elements of flexible

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resilient material. The first portion of the second surface defines a first indicator representing a first signal which is visible at nighttime. The first portion of the second surface further defines a plurality of upstanding hooking elements of flexible resilient material. A second fabric member is secured to the article of clothing in registry with the first portion of the second surface of the first member. The second member has a surface defining a second indicator representing the first signal which is visible both during daytime and nighttime. The surface of the second member further defines a plurality of upstanding complementary hooking elements. The first member is adjustable to a first position wherein the first portion of the first surface is folded back against the second portion of the first surface in face-to-face relationship to expose the first and second indicators. The first member is maintained in the first position by the engagement of a large number of hooking elements on the first portion of the first surface with a large number of complementary hooking elements on the second portion of the first surface to constitute a bond which resists separation but which is readily separable by peeling forces applied substantially normal in the interfacial plane of engagement. The first member is further adjustable to a second position wherein the first portion of the second surface is pressed into face-to-face relationship with the second member to cover completely the first and second indicators. The first member is maintained in the second position by engagement of a large number of hooking elements on the first portion of the second surface with a large number of complementary hooking elements on the surface of the second member to constitute a bond which resists separation but which is readily separable by peeling forces applied substantially normal to the interfacial plane of engagement.

The present signalling device further may be provided with a first indicator representing a second signal which is visible both daytime and nighttime. The first indicator defines the second portion of the second surface of the first member. The second portion of the second surface further defines a plurality of upstanding hooking elements of flexible resilient material. In this embodiment, a third fabric member is secured to the article of clothing in registry with the second portion of the second surface of the first member. The third member has a surface defining a second indicator representing the second signal which is visible both daytime and nighttime. The surface of the third member further defines a plurality of upstanding complementary hooking elements. The first member is adjustable to a third position wherein the second portion of the first surface is folded back against the first portion of the first surface in face-to-face relationship to expose the first and second indicators representing the second signal. The first member is maintained in a third position by the engagement of a large number of hooking elements on the first portion of the first surface with a large number of complementary hooking elements on the second portion of the first surface. The first member is further adjustable to a fourth position wherein the second portion of the second surface is brought in face-to-face relationship with the third member to cover completely the first and second indicators representing the second signal. The first member is maintained in the fourth position by the engagement of a large number of hooking elements on the second portion of the second surface with a large number of complementary hooking elements on the surface of the third member.

The present invention utilizes hook and loop fasteners such as those described in U.S. Patents Nos. 2,717,427 and 3,009,225 which include separable members which comprise a sheet of woven fiber having raised threads of

synthetic material wherein the loops of one tape member are cut at their outer extremities to form hooks while the loops of the others remain uncut. It is also contemplated that a given member may comprise both hooks and loops. When the two members of the fasteners are pressed together in face-to-face relationship there is substantial engagement of hook threads with loop threads. A considerable effort must be applied to separate the members unless they are peeled apart. In that event, the members may be separated quite easily.

The present signaling device has the advantages of durability and simplicity of operation. It may be operated rapidly and effectively by any foot soldier regardless of training. When required, a given indicator may be exposed quickly and made visible to air support during both daytime and nighttime without giving away to the enemy the position of the sender.

Brief description of the drawings

FIG. 1 is a plan view of a first surface of the first fabric member of the present signaling device as secured to an article of clothing;

FIG. 1A is a partial sectional view taken substantially along line A—A of FIG. 1;

FIG. 2 is a plan view of a second or reverse surface of the first fabric member of FIG. 1;

FIG. 3 is a plan view of a second fabric member of the present signaling device as secured to the article of clothing;

FIG. 4 is a plan view in partial section of the present signaling device wherein the first member overlies and completely covers the second member;

FIG. 5 is a plan view of the present signaling device wherein the first member is folded back to expose the second member;

FIG. 6 is a plan view of a first surface of the first member secured to the article of clothing in accordance with a second embodiment of the present signaling device;

FIG. 7 is a plan view of the second embodiment of the second or reverse surface of the first member of the present signaling device;

FIG. 8 is a plan view of the second and third members of the present signaling device secured to an article of clothing in accordance with the second embodiment;

FIG. 9 is a plan view in partial section of the second embodiment of the present signaling device wherein the first member overlies and completely covers the second and third members;

FIG. 9A is a plan view of the second embodiment of the present signaling device wherein the first member is folded back against itself to expose the second member; and

FIG. 9B is a plan view of the second embodiment of the present signaling device wherein the first member is folded back against itself to expose the third member.

Description of the preferred embodiments

Referring initially to FIGS. 1-5, a signaling device of the present invention comprises a first fabric member 10 which is secured to an article of clothing 11 by stitching 12 or other suitable means. The first member 10 is usually the same color or colors as the article of clothing 11 to which it is secured so as not to be readily visible. A first surface of the first member 10 comprises a first portion 13 and a second portion 14. The first portion 13 of the first surface defines a plurality of upstanding hooking elements 15 which are raised loop threads of synthetic material such as superpolyamide. The hooking elements 15 may be cut at their outer extremities to form hooks as shown in the present embodiment or they may be closed loops. The second portion 14 of the first surface defines a plurality of complementary hooking elements 16 which also are raised loop threads of synthetic material such as superpolyamide. The complementary hooking elements 16 may be closed loops as shown in the present

embodiment or they may be cut at their outer extremities to form hooks. While hook type hooking elements 15 have been provided on the first portion 13 of the first surface and loop type hooking elements 16 have been provided on the second portion 14 of the first surface, it is intended that they may be interchanged and thus hooks provided on the second portion 14 and loops on the first portion 13. In fact, it is contemplated that a given surface could comprise both hook type and loop type hooking elements.

A second or reverse surface of the first member 10 includes a first portion 18 which defines a first indicator 19. The first indicator 19 is colored and configured to represent a first signal and includes a daytime-visible portion 20 and a nighttime-visible portion 21. In the present embodiment, the daytime-visible portion 20 defines a plurality of upstanding hooking elements 22 which are raised loop threads of synthetic material such as superpolyamide. The hooking elements 22 may be cut at their outer extremities to form hooks as shown in the present embodiment or they may be closed loops. It is further contemplated that the hooking elements 22 may define the entire first portion 18 of the second surface including or excluding the daytime visible portion 20 of the first indicator 19. The daytime visible portion 20 of the first indicator 19 is colored with a daylight fluorescent pigment which is available in a variety of colors such as red, yellow, orange and green. It is intended that each color represent a different signal. For example, the color red might indicate the need for ammunition, and the color yellow might indicate the need for medical supplies. The nighttime-visible portion 21 of the first indicator 19 comprises a light-reflecting of luminescent tape. The tape may be arranged in given patterns on the indicator 19 to represent different signals.

As best shown in FIGS. 3 and 4, a second fabric member 25 is secured to the article of clothing 11 in registry with the first portion 18 of the second surface of the first member 10. An exposed surface of the second member 25 defines a second indicator identical in color and configuration to the first indicator 19. The second indicator has a daytime-visible portion 26 and a nighttime-visible portion 27. The exposed surface of the second member 25 further defines a plurality of upstanding complementary hooking elements 28 which also are raised loop threads of synthetic material such as superpolyamide. The complementary hooking elements 28 may be closed loops as shown in the present embodiment or they may be cut at their outer extremities to form hooks.

To operate the present signaling apparatus, the first member 10 is adjusted to a first position wherein the first portion 13 of the first surface is folded back against the second portion 14 of the first surface in face-to-face relationship to expose the first and second indicators 19, 25. The first member 10 is maintained in the first position by the engagement of a large number of hooking elements 15 on the first portion 13 of the first surface with a large number of complementary hooking elements 16 on the second portion 14 of the first surface. The elements 15, 16 so engaged, resist separation but may be separated readily by a peeling force applied substantially normal to the interfacial plane of engagement.

To render the signaling device inoperative, the first and second portions 13, 14 of the first surface are separated as described above and the first member 10 is adjusted to a second position wherein the first portion 18 of the second surface is pressed into face-to-face relationship with the second member 25 to cover completely the first and second indicators 19, 25. The first member 10 is maintained in the second position by the engagement of a large number of hooking elements 22 on the first portion 18 of the second surface with a large number of complementary hooking elements 28 on the surface of the second member 25. The bond between elements 22, 28 is identical to the bond between elements 15, 16 previously described. As in the former instance, the elements 22, 28 so engaged,

resist separation but may be separated readily by a peeling force applied substantially normal to the interfacial plane of engagement.

Referring now to FIGS. 6-9B, a second embodiment of the signaling device of the present invention comprises a first fabric member 30 which is secured to an article of clothing 31 by stitching 32 or other suitable means. A first surface of the first member 30 comprises a first portion 33 and a second portion 34. The first portion 33 of the first surface defines a plurality of upstanding hooking elements 35 which are raised loop threads of synthetic material such as superpolyamide. The hooking elements 35 may be cut at their outer extremities to form hooks as shown in the present embodiment or they may be closed loops. The second portion 34 of the first surface defines a plurality of complementary hooking elements 36 which also are raised loop threads of synthetic material such as superpolyamide. The complementary hooking elements 36 may be closed loops as shown in the present embodiment or they may be cut at their outer extremities to form hooks. While hook type hooking elements 35 have been provided on the first portion 33 of the first surface and loop type hooking elements 36 have been provided on the second portion 34 of the first surface, it is intended that they may be interchanged and thus hooks provided on the second portion 34 and loops on the first portion 33. As in the case of the first embodiment, it is contemplated that a given surface could comprise both hook type and loop type hooking elements.

A second or reverse surface of the first fabric member 30 includes a first portion 38 which defines a first indicator 39 colored and configured to represent a first signal and a second portion 40 of the second surface of the first member 30 defines a first indicator 41 colored and configured to represent a second signal. The indicators 39, 41 each include a daytime-visible portion 42 and a nighttime-visible portion 43. The daytime-visible portion 42 of the indicator 39 and the daytime-visible portion 44 of the indicator 41 are colored with a daylight fluorescent pigment as in the case of the first embodiment, but the color of the daytime-visible portion 42 is different from that of daytime-visible portion 44. The nighttime-visible portion 43 of the indicator 39 and the nighttime-visible portion 45 of the indicator 41 comprise a light reflective case as in the first embodiment but the pattern of nighttime-visible portion 43 is different from the pattern of nighttime-visible portion 45. It is thus readily apparent that the indicator 39 and the indicator 41 represent different signals. The daytime-visible portion 42 of the indicator 39 and the daytime-visible portion 44 of the indicator 41 define a plurality of upstanding hooking elements 46 and 47 respectively which are raised loop threads of synthetic material such as superpolyamide. The hooking elements 46, 47 may be cut at their outer extremities to become hooks as shown in the present embodiment or they may be closed loops. It is further contemplated that the hooking elements 46 may define the entire first portion 38 of the second surface including or excluding the daytime-visible portion 42 of the indicator 39 and that the hooking elements 47 may define the entire second portion 40 of the second surface including or excluding the daytime-visible portion 44 of the indicator 41.

As best shown in FIGS. 7 and 8 a second fabric member 51 is secured to the article of clothing 31 in registry with the first portion 38 of the second surface of the first member 30 and a third fabric member 52 is secured to the article of clothing 31 in registry with the second portion 40 of the second surface of the first member 30. An exposed surface of the second member 51 defines a second indicator representing the first signal which is identical in color and configuration to the indicator 39 and an exposure surface of the third member 52 defines a second indicator representing the second signal which is identical in color and configuration to the indicator 41. The indicators 51, 52 have daytime-visible portions 53,

54 and nighttime-visible portions 55, 56. The exposed surfaces of the second member 51 and the third member 52 further define a plurality of upstanding hooking elements 57, 58 which also are raised loop threads of synthetic material such as superpolyamide. The complementary hooking elements 57, 58 may be closed loops as shown in the present embodiment or they may be cut at their outer extremities to form hooks.

In operation, the second embodiment of the present signaling device may be adjusted to a first position wherein the indicators 39, 51 representing the first signal are exposed by folding the first portion 33 of the first surface of the first member 30 into face-to-face contact with the second portion 34 of the first surface. The first member 30 is maintained in the first position by the engagement of a large number of hooking elements 35 on the first portion 33 of the first surface with a large number of complementary hooking elements 36 on the second portion 34 of the first surface. The elements 35, 36 so engaged resist separation but may be separated readily by a peeling force applied substantially normal to the interfacial plane of engagement. The first signal may be rendered inoperative by separating the first and second portions 33, 34 of the first surface as described above and adjusting the first member 30 to a second position wherein the first portion 38 of the second surface is pressed into face-to-face contact with the second member 51 to cover completely the indicators 39, 51 which represent the first signal. The first member 30 is maintained in the second position by engagement of a large number of hooking elements 46 on the first portion 38 of the second surface with a large number of complementary hooking elements 57 on the surface of the second member 51. The bond between elements 46, 57 is identical to the bond between elements 35, 36 previously described.

The second embodiment of the present signaling device is further adjustable to a third position wherein the second portion 34 of the first surface 30 is folded back against the first portion 33 of the first surface in face-to-face contact to expose the indicators 41, 52 which represent the second signal. The first member 30 is maintained in the third position by the engagement of a large number of hooking elements 35 on the first portion 33 of the first surface with a large number of complementary hooking elements 36 on the second portion 34 of the first surface. To render the second signal inoperative, the first and second portions 33, 34 of the first surface are separated and the first member 30 is adjusted to a fourth position wherein the second portion 40 of the second surface is pressed into face-to-face contact with the third member 52 to cover completely the indicators 41, 52 which represent the second signal. The first member 30 is maintained in the fourth position by engagement of a large number of hooking elements 47 on the second portion 40 of the second surface with a large number of complementary hooking elements 58 on the surface of the third member 52. As in the three former instances, the elements 47, 58 so engaged, resist separation but may be separated readily by a peeling force applied substantially normal to the interfacial plane of engagement.

I claim:

1. A signaling device to be worn on an article of clothing comprising a first fabric member secured to the article of clothing, the first member having first and second surfaces, each surface being divided into first and second portions, the first portion of the first surface defining a plurality of upstanding hooking elements of flexible resilient material, the second portion of the first surface defining a plurality of upstanding complementary hooking elements of flexible resilient material, and the first portion of the second surface defining a first indicator representing a first signal, the first indicator having a daytime-visible portion and a nighttime-visible portion, the first portion of the second surface further defining a plurality of upstanding hooking elements of flexible

resilient material; and, a second fabric member secured to the article of clothing in registry with the first portion of the second surface of the first member, the second member having a surface defining a second indicator representing the first signal, the second indicator having a daytime-visible portion and a nighttime-visible portion, the surface of the second member further defining a plurality of upstanding complementary hooking elements, the first member being adjustable to a first position wherein the first portion of the first surface is folded back against the second portion of the first surface in face-to-face relationship to expose the first and second indicators, the first member being maintained in the first position by the engagement of a large number of hooking elements on the first portion of the first surface with a large number of complementary hooking elements on the second portion of the first surface to constitute a bond which resists separation but which is readily separable by peeling forces applied substantially normal to the interfacial plane of engagement, and the first member being further adjustable to a second position wherein the first portion of the second surface is pressed into face-to-face relationship with the second member to cover completely the first and second indicators, the first member being maintained in the second position by the engagement of a large number of hooking elements on the first portion of the second surface with a large number of complementary hooking elements on the surface of the second member to constitute a bond which resists separation but which is readily separable by peeling forces applied substantially normal to the interfacial plane of engagement.

2. A signaling device according to claim 1 wherein the first surface of the first member and the article of clothing are of the same color.

3. A signaling device according to claim 1 wherein the daytime-visible portions of the first and second indicators representing the first signal are of a first bright color which is visible from a great distance and the nighttime-visible portions comprise light reflective material arranged in a first pattern.

4. A signaling device according to claim 1 further comprising a first indicator representing a second signal, the first indicator defining the second portion of the second surface of the first member and having a daytime-visible portion and a nighttime-visible portion, the second portion of the second surface further defining a plurality of upstanding hooking elements of flexible resilient material; and a third fabric member secured to the article of cloth-

ing in registry with the second portion of the second surface of the first member, the third member having a surface defining a second indicator representing the second signal, the second indicator representing the second signal having a daytime-visible portion and a nighttime-visible portion, the surface of the third member further defining a plurality of upstanding complementary hooking elements, the first member being adjustable to a third position wherein the second portion of the first surface is folded back against the first portion of the first surface in face-to-face relationship to expose the first and second indicators representing the second signal, the first member being maintained in the third position by the engagement of a large number of hooking elements on the first portion of the first surface with a large number of complementary hooking elements on the second portion of the first surface, and the first member being further adjustable to a fourth position wherein the second portion of the second surface is pressed into face-to-face relationship with the third member to cover completely the first and second indicators representing the second signal, the first member being maintained in the fourth position by the engagement of a large number of hooking elements on the second portion of the second surface with a large number of complementary hooking elements on the surface of the third member.

5. A signaling device according to claim 4 wherein the daytime-visible portions of the first and second indicators representing the second signal are of a second bright color which is visible from a great distance and the nighttime-visible portions comprise light reflective material arranged in a second pattern.

References Cited

UNITED STATES PATENTS

2,342,005	2/1944	Mittag	250—71
3,279,008	10/1966	Wallack	24—16
3,403,429	10/1968	Smith	24—204

FOREIGN PATENTS

639,490	4/1962	Canada.
411,635	11/1966	Switzerland.

45 LOUIS J. CAPOZI, Primary Examiner

U.S. Cl. X.R.

24—204; 40—129

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,472,198 Dated October 14, 1969

Inventor(s) Franz G. Rinecker

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 2, line 29, "postion" should read --position--;

Column 2, line 36, "signalling" should read --signaling--;

Column 4, line 23, "visibl't" should read --visible--;

Column 4, line 32, "of" should read --or--;

Column 5, line 59, "ad" should read --and--;

Column 5, line 72, "exposure" should read --exposed--; and

Column 8, line 22, "positon" should read --position--.

SIGNED AND
SEALED
MAY 19 1970

(SEAL)

Attest:

Edward M. Fletcher, Jr.

Attesting Officer

WILLIAM E. SCHUYLER, JR.
Commissioner of Patents