

[54] **DESTRUCTION RESISTANT TAG**  
 [75] Inventors: **Claude J. Hafner**, Bethlehem; **Bruce D. Bush**, Allentown, both of Pa.  
 [73] Assignee: **Bethlehem Steel Corporation**, Bethlehem, Pa.  
 [22] Filed: **Dec. 13, 1972**  
 [21] Appl. No.: **314,637**

3,660,215 5/1972 Pawlicki..... 161/93 X  
**FOREIGN PATENTS OR APPLICATIONS**  
 14,089 6/1911 Great Britain..... 40/27 X

*Primary Examiner*—Robert W. Michell  
*Assistant Examiner*—Wenceslao J. Contreras  
*Attorney, Agent, or Firm*—Joseph J. O’Keefe; Charles A. Wilkinson

[52] **U.S. Cl.**..... 40/27, 40/2 R  
 [51] **Int. Cl.**..... G09f 3/02  
 [58] **Field of Search**..... 40/2, 10 C, 27, 135; 35/66; 161/93

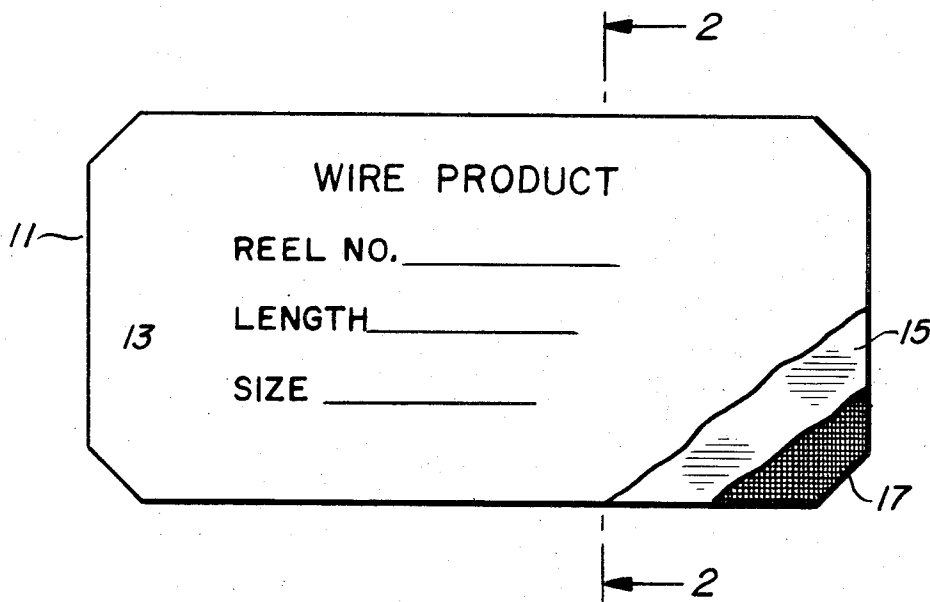
[57] **ABSTRACT**

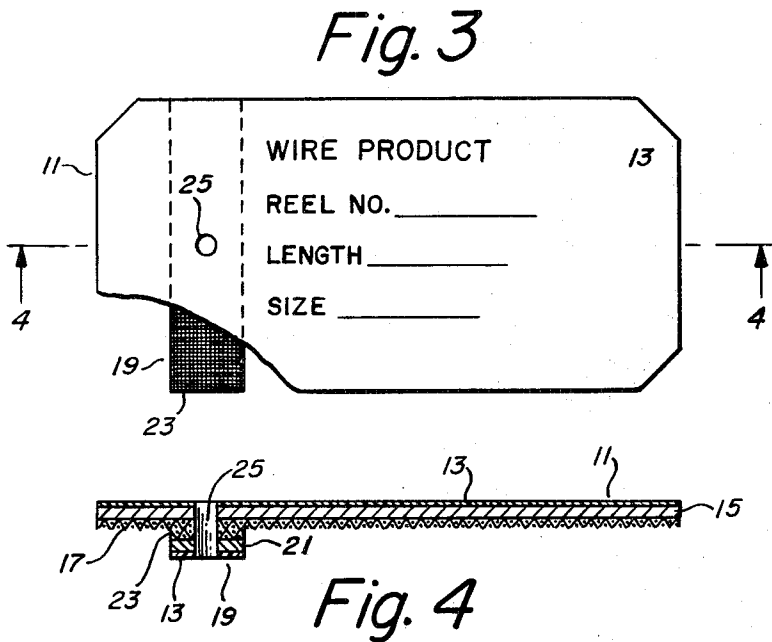
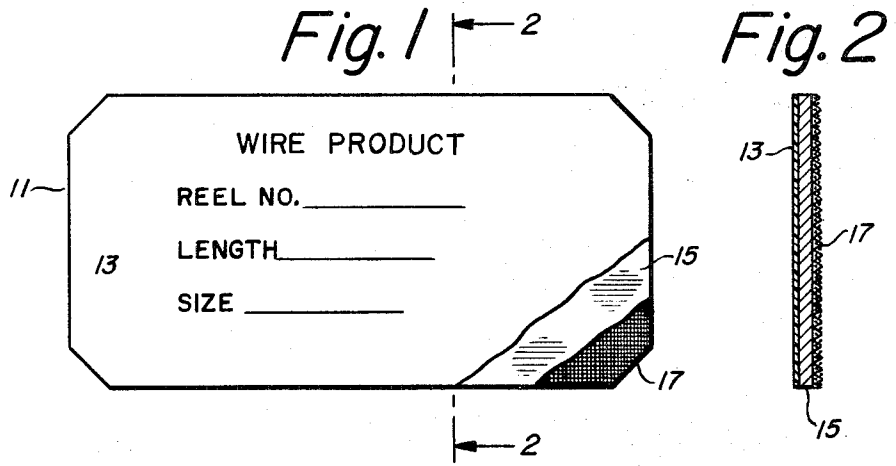
A weather and damage resistant tag is made from a lamination of thin soft metal sheet and cross woven fiberglass securely bonded together with an adhesive. Reinforcing patches composed of a lamination of thin sheet metal and a woven cloth backing are preferably secured to the tag with the metal portion of the patch uppermost surrounding any attachment orifices extending through the tag body.

**8 Claims, 4 Drawing Figures**

[56] **References Cited**

<b>UNITED STATES PATENTS</b>			
824,781	7/1906	Pricke.....	35/66
1,727,806	9/1929	Bietsch.....	40/10 C
2,698,991	1/1955	Messick.....	161/93 X





**DESTRUCTION RESISTANT TAG****BACKGROUND OF THE INVENTION**

This invention relates to tags and the like and more particularly to durable weather resistant tags.

Tags of various sorts have been used for labeling objects, and particularly goods in storage, for many years. The ubiquitous paper or cardboard tag has customarily been used for labeling goods both indoors and outdoors. Such cardboard tags are usually satisfactory for labeling in indoor locations in warehouses and the like. Cardboard tags frequently become illegible within a very short time in outdoor locations, however, often resulting in serious question as to the identity of the goods which the tags supposedly were to identify. Large metal articles or bundles such as coils of steel wire or the like are often stored in outdoor locations prior to use. Illegibility of the marking tags can on such products have very serious consequence since one type of wire may have very different properties from another which appears to the naked eye to be the same. The customary periodic inventory of such stored products also becomes very difficult, if not impossible, if the labeling tags become illegible through exposure to the weather.

Various attempts have been made to alleviate the problem of illegible tags by making the tags of materials more durable when exposed to the vicissitudes of weather than the customary cardboard tag. Thus tags have been made from plastic, metal, plastic coated paper and various other substances. Attempts have also been made to construct a tag from several materials laminated together. For example a thin ferrous metal sheet has been secured to a backing of a thin plastic sheet such as polyethylene or the like.

One notable example of an attempt to make a weather resistant, durable, yet easily markable tag is disclosed in U.S. Pat. No. 1,458,155 issued in 1923 to Shreeve. Shreeve used a thin copper strip as his tag. The copper was easily embossable with a stylus and resistant to destruction. A backing of friction tape in one embodiment of the Shreeve tag enabled the tag to be adhered to the object, such as a military signal wire, which was to be labeled.

Another notable tag is disclosed in U.S. Pat. No. 1,462,220 issued in 1923 to Wiegandt for a ferrous sheet metal tag coated with a light colored paint to enable the tag to be easily written upon.

Likewise U.S. Pat. No. 2,768,460 issued in 1956 to Northrup discloses a label or tag composed of a thin aluminum foil laminated to a paper backing and coated on both sides with a lacquer coating to provide a thin flexible label.

While the prior art tags have each been useful in the particular area for which they have been designed, each has had serious drawbacks which have prevented it from widely replacing the older cardboard tag even in weather exposed locations.

A tag for use in outdoor locations should have the following characteristics:

- a. durability,
  1. weather resistance,
  2. resistance to physical damage,
- b. imprintability,
  1. easily marked with normal writing implements,
  2. durability of legible imprint,

c. suitability for mass production at low unit cost.

Each of the prior art tags has lacked one or more of the foregoing characteristics. For example, ferrous sheet metal tags because of their hardness often require a special embossing implement such as a typewriter having carbide tipped keys to emboss a permanent legend in the metal, and, while more weather resistant than cardboard, are both corrodable and subject to tearing upon impact.

Difficulty has also been encountered in manufacturing tags adequately reinforced against tearing about any tie wire orifices in the tag. The usual metal eyelets or cardboard patches are either too bulky to pass through high speed printing machinery or the patches are not strong enough to adequately reinforce the tags. One notable attempt to remedy this problem is disclosed in U.S. Pat. No. 2,545,505 issued in 1951 to Wall. Wall uses internal metal reinforcing elements around perforations in a cardboard tag in place of the usual metal or fiber grommet. Wall states that the flat internal metal reinforcement under the outer layers of the tag leaves a relatively smooth and uniform surface upon the tag which does not interfere with printing of the tag in an automatic press. Unfortunately the internal reinforcing arrangement of Wall, while effective to reinforce the tag, is somewhat cumbersome to manufacture.

**SUMMARY OF THE INVENTION**

The foregoing disadvantages of prior tags have now been obviated by the tag of the present invention which is formed from a relatively thin soft corrosion resistant metal laminated to a cross woven fiberglass backing. The metal has a painted surface which can be marked or written upon with a normal writing instrument such as a pencil or ball point pen. The soft metal is easily embossed by the manual pressure of writing so that a permanent embossed legend is formed. The fiberglass backing provides additional corrosion protection to the opposite side of the tag, a resilient backing which allows the superimposed metal sheet to be easily indented with near normal writing pressure with a pencil or ball point pen, and, most important, tear resistance for the composite tag in all directions.

Preferably the composite laminated tag of this invention is combined with a reinforcing patch surrounding any tie orifices and formed from a thin metal sheet laminated to a woven reinforcing backing with the backing adhered to the tag. The combined tag and reinforced patch provide an extremely tear resistant tag in the vicinity of any orifices in the tag and the tag will easily pass through high speed automatic printing equipment.

**BRIEF DESCRIPTION OF THE DRAWINGS**

FIG. 1 depicts a tag made in accordance with the present invention.

FIG. 2 is a cross section of the tag of FIG. 1 along 2-2.

FIG. 3 is a top view of a combined tag and reinforcing patch made in accordance with the present invention.

FIG. 4 is a cross section of the tag of FIG. 3 along 4-4.

### DESCRIPTION OF THE PREFERRED EMBODIMENT

In FIGS. 1 and 2 there is shown a tag 11 having a coating or coated surface 13 adapted for printing or writing upon with a writing instrument such as a ball point pen or pencil. Surface 13 is comprised of a smooth light colored paint or enamel coating such as a yellow paint suitable for receiving easily legible imprints. The coating 13 is underlain by a relatively thin, soft metal sheet 15 having a combined thickness and hardness such that the sheet metal may be fairly easily indented or embossed by manual writing pressure with a pencil or ball point pen. A sheet of aluminum annealed to dead softness or near dead softness and from about .002 to .006 inches in thickness is suitable. (Dead softness may be defined as the softest metallurgical structure obtainable with a particular metal.) Other soft corrosion resistant metals such as very thin annealed stainless steel or the like could also be used. A thin copper sheet would be readily embossable but would be rather expensive for widespread use.

Upon the opposite face of the metal sheet 15 from the coating 13 there is laminated or adhesively secured a backing composed of a cross woven glass fiber sheet 17 composed of a layer of woven glass fiber cloth. The sheet 17 may be intimately adhered or laminated to the metal sheet 15 with any suitable strong adhesive such as a water and/or heat resistant epoxy resin or the like. Preferably the adhesive resin serves also as an impregnant for the glass fiber sheet. The cross woven glass fiber is not only completely weather resistant and provides a resilient backing to facilitate writing upon and embossing of the overlying metal sheet 15 but also serves to provide tear resistance to the thin metal sheet 15 in all directions. Thus if the sheet 15 should begin to tear because of tensional or impact forces applied to it while in use, the tear will quickly reach a glass fiber disposed across the direction of the tear and adhesively secured to the surface of the metal so that the tearing action is blocked from proceeding farther. In order that the tear resistance of the tag shall be approximately equal in all directions it is necessary that the fibers of the warp and woof of the glass fiber cross woven cloth shall have approximately equal strengths. By equal it is meant that the strength of the warp and the woof fibers shall be within 20 to 30 pounds tensile strength of each other.

The combination of the soft metal and resilient glass fiber backing produces tags of great tear and tear out resistance upon which information can be printed, embossed or debossed either manually and/or mechanically without the need of special marking equipment. Pencils, ballpoint pens, typewriters, teletypewriters, high speed printers and the like can be used to efficiently print and simultaneously emboss data upon the tags without especially hardened type caps or the like. Data may also be impressed into the tags from embossed or debossed credit card type marking apparatus.

The embossing or debossing (when viewed from the opposite side) into the tag greatly increases the retention of legible data far in excess of the period of legibility of inks and other similar markings and/or printing materials and is very much less susceptible to deterioration not only by weather but also by heat such as accidental fire or the like. The backing material not only

increases the strength and tear resistance of the tag but also provides the resiliency which allows the soft metal or foil to be embossed or debossed.

In FIGS. 3 and 4 there is illustrated a preferred combination of the present invention in which a patch 19 comprised of a thin metal sheet 21 laminated to a woven or consolidated backing material 23 is adhesively secured to one side of the tag 11 surrounding an orifice 25 extending through the tag. Preferably the patch 19 is secured to the glass fiber sheet 17 although it may also be secured to the metal sheet 15 with good results. In each case it is imperative that the backing material 23 be positioned against the tag in order to attain a proper reinforcing action.

Conveniently the patch 19 may be formed from the same materials as the tag 11. Such a combined tag will have superior properties. However, it is not necessary for the patch to be as soft as the tag material and it is also not necessary for the backing to be a cross woven glass fiber, although if it is the tag will have additional strength and tear resistance in the vicinity of the patch. Patch 19 is extremely tear resistant if it is constructed with a backing composed of a strong cross woven cloth. Such a cloth need not necessarily be composed of fiberglass since the backing upon the patch will be protected from the effects of weather by being interposed between the metal portion of the patch and the tag.

In FIG. 3 the patch 19 is shown extending completely across the back of the tag 11. However, it will be readily understood that the patch may extend only a relatively short distance from the orifice and may be any shape such as round, square, oval or the like. A round patch will normally provide the most all around reinforcing with the least material.

The tensile strength of the woof and the warp of the backing of the tag and/or the patch may be between about 125 to 175 pounds test pull, up to 500 or more pounds test pull. One glass fiber cloth which has been found suitable has a tensile strength of approximately 140 pounds in one direction and 150 pounds in the other direction along the weave.

We claim:

1. A durable weather and physical damage resistant tag for the reception and permanent retention of legible labeling information comprising:
  - a. a first metal sheet having a hardness and gage such that it can be permanently embossed by manual application of pressure with a writing instrument,
  - b. a second cross woven glass fiber sheet having a substantially uniform tear strength along the warp and woof of the weave of the glass fiber firmly laminated to one side of the first sheet and adapted to reinforce the first sheet and provide substantially equal tear resistance to the first sheet in all directions and to function as a resilient backing to facilitate writing upon and embossing of the first sheet, and
  - c. a third pigmented coating having a smooth surface suitable for marking with a writing instrument on the opposite side of the first metal sheet from said second glass fiber sheet.
2. A tag according to claim 1 wherein the first metal sheet is an annealed dead soft aluminum sheet having a gage between .002 and .006 inches.
3. A tag according to claim 1 wherein the second glass fiber sheet has a warp and a woof having approximately equal strengths.

5

6

- 4. A tag according to claim 1 additionally comprising:
- d. a coincident orifice in said first and second sheets, and
- e. a reinforcement surrounding said orifice comprising a laminate of sheet metal and a resin bonded fibrous sheet secured to said tag through said bonded fibrous sheet and an interposed layer of adhesive.
- 5. A tag according to claim 4 wherein said first sheet is an annealed dead soft aluminum sheet having a gage

between .002 and .006.

6. A tag according to claim 5 wherein the second glass fiber sheet has a warp and a woof with approximately equal strengths.

7. A tag according to claim 6 wherein the reinforcement of (e) is adhered to the second sheet of the tag.

8. A tag according to claim 7 wherein the reinforcement is comprised of a lamination of an aluminum sheet and a cross woven glass fiber cloth.

\* \* \* \* \*

15

20

25

30

35

40

45

50

55

60

65