

# United States Patent [19]

Sherman et al.

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[54] **MAGNETIC CLASP FOR WRISTWATCH STRAP**

[75] Inventors: Norman Sherman, Woodbury; Victor Shiff, Waterbury, both of Conn.

[73] Assignee: Timex Corporation, Waterbury, Conn.

[21] Appl. No.: 375,990

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[51] Int. Cl.<sup>5</sup> ..... A44B 21/00; A44C 5/18

[52] U.S. Cl. .... 24/303; 24/71 J;  
24/265 WS

[58] Field of Search ..... 24/303, 49 M, 265 WS,  
24/71 J, 688; 292/251.5

[56] **References Cited**

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4,255,837	3/1981	Holtz	24/243 R

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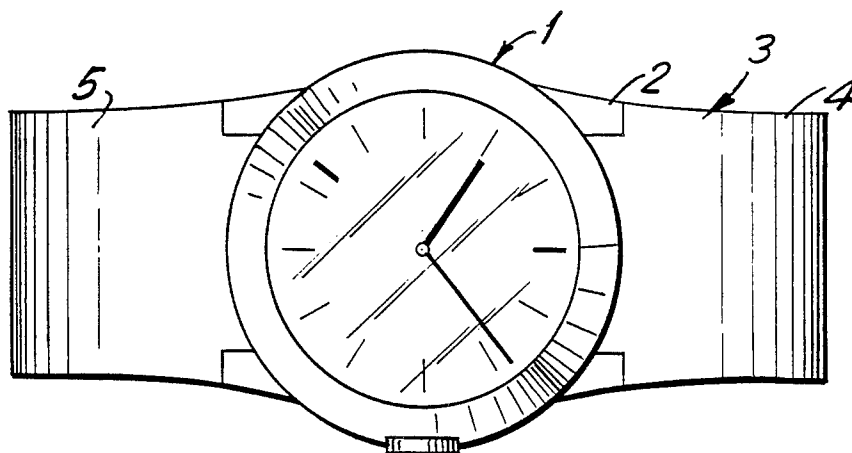
Primary Examiner—Victor N. Sakran

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[57] **ABSTRACT**

A strap for holding a wristwatch has a pair of separable flexible strap ends adapted to curve around the wrist and to overlap one another to provide an overlapped section. At least one strap end of thermoplastic material has particles of permanently magnetizable material embedded in the thermoplastic material and magnetized to provide rows of alternating magnetic poles. The strap ends have surfaces contacting one another throughout the overlapped section and mutually nesting uniformly spaced interlocking teeth, whereby the magnetized particles provide a holding force resisting separation of the strap ends, while the nested teeth prevent sliding disengagement movement between strap ends.

10 Claims, 3 Drawing Sheets



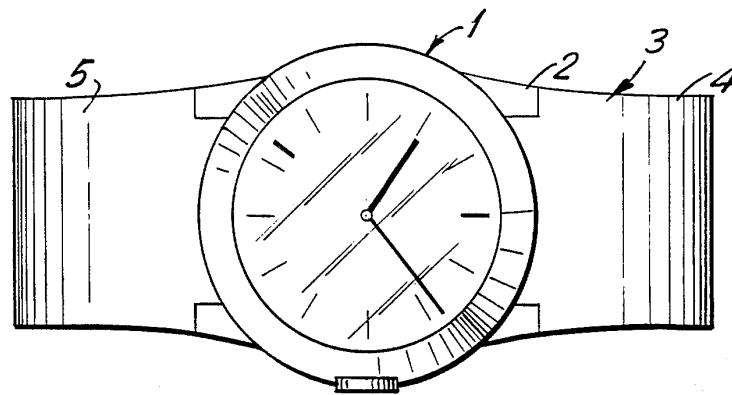


FIG. 1

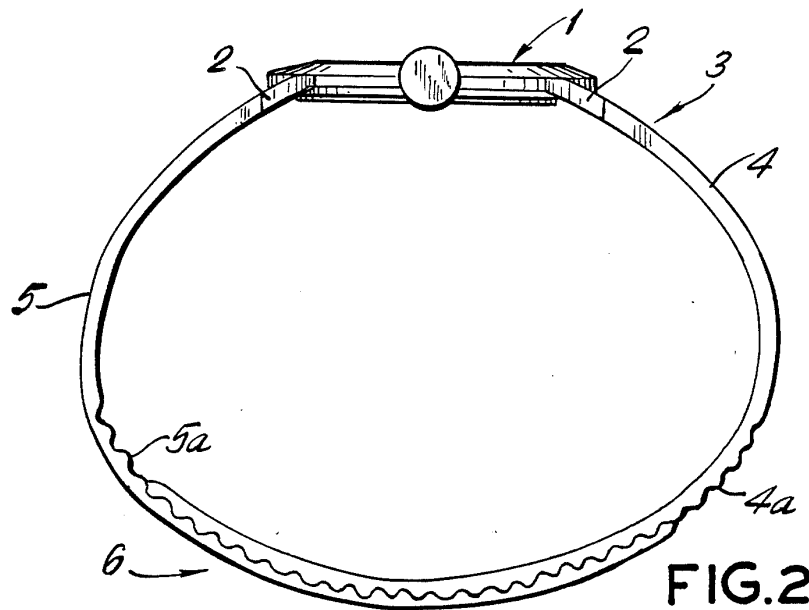


FIG. 2

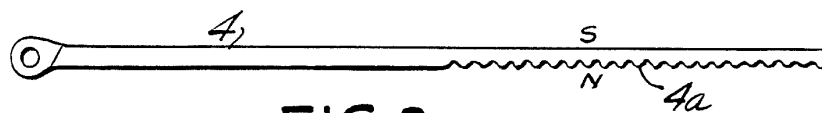


FIG. 3

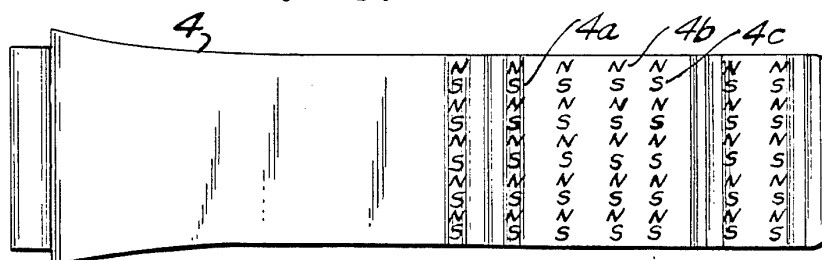


FIG. 4

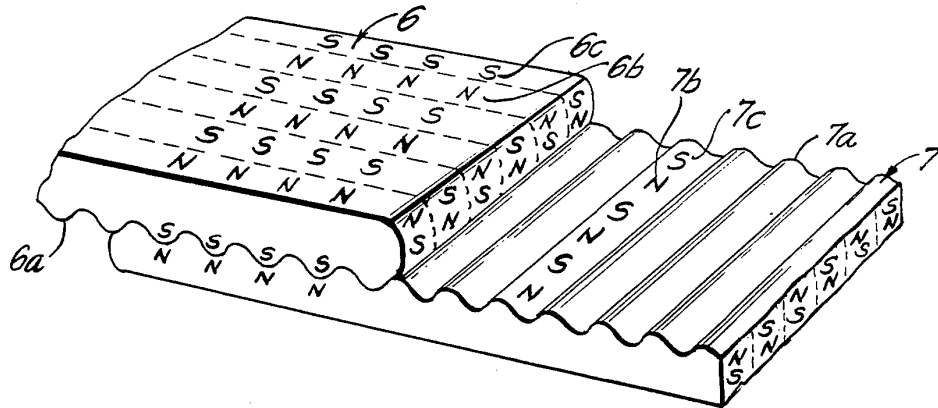


FIG. 5

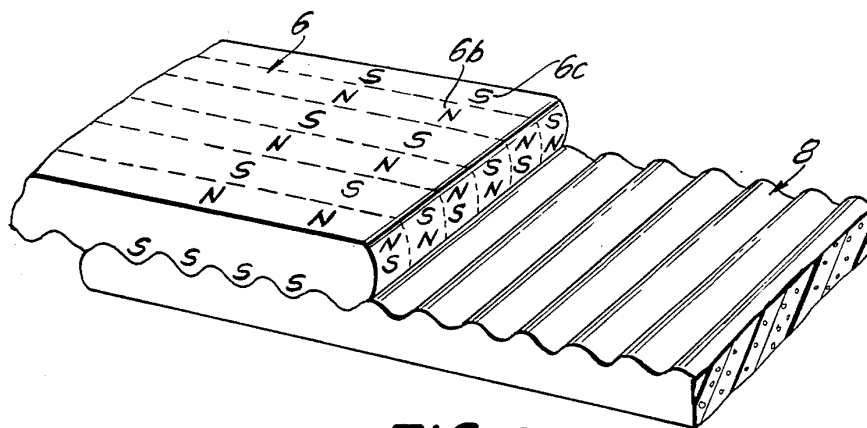


FIG. 6

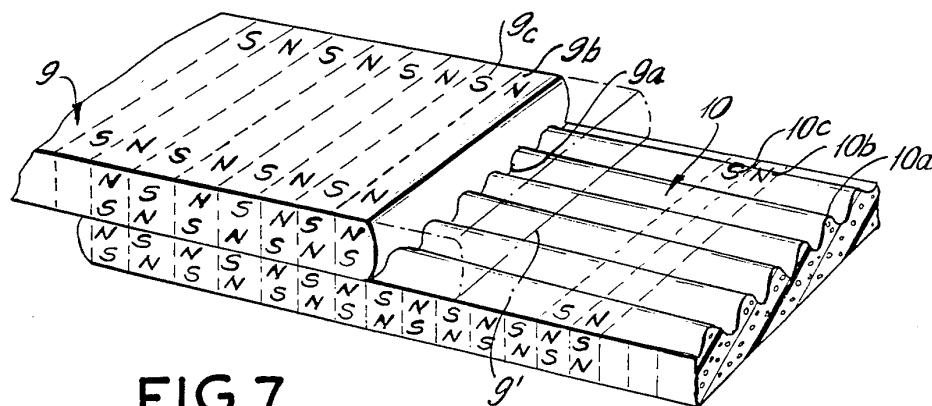


FIG. 7

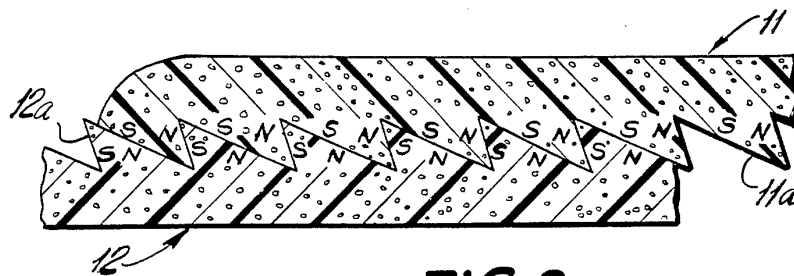


FIG. 8

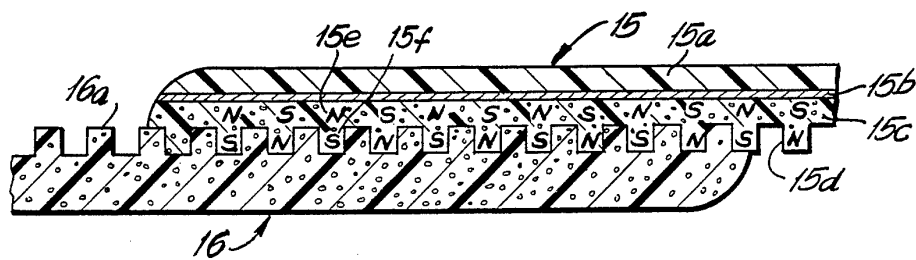


FIG. 9

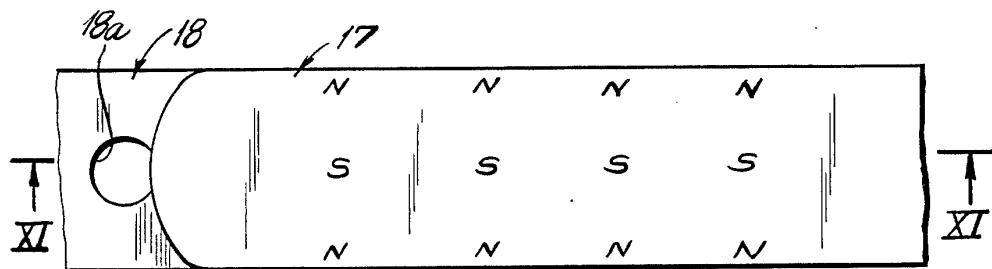


FIG. 10

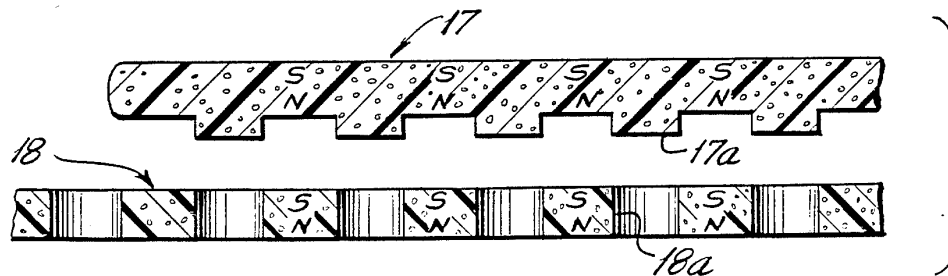


FIG. 11

**MAGNETIC CLASP FOR WRISTWATCH STRAP****BACKGROUND OF THE INVENTION**

This invention relates generally to straps for wrist instruments, especially wristwatches and relates to improved clasps for attaching the strap ends around the wrist of the wearer. More particularly, the invention relates to an improved wristwatch flexible strap and clasp attachment.

Conventional wristwatches are held on the wrist by leather, metal or plastic straps, bands or bracelets, which may be expanded to go over the wrist or attached around the wrist by attaching strap ends with buckle, clasp or other type of detachable fasteners. This invention relates to wristwatch attachments employing a flexible strap with a pair of strap ends. Typically, the strap ends are connected with a buckle which provides for adjustment of the strap length. The buckle adds to the thickness of the strap, requires a "keeper" to keep the tongue of the strap in place, and sometimes is unsightly or has corners which catch upon sleeves or clothing.

Other types of clasps have been suggested for jewelry, wrist instruments and wristwatches for straps with overlapping strap ends. One design has opposing members coated with fibrous material on one strap end and a layer of material having resilient hook-like members on the other strap end (sold under the registered trademark Velcro®), such a construction being shown in Montague U.S. Pat. No. 3,747,171, issued July 24, 1973. Another type of bracelet clasp suitable for a strap of flexible thermoplastic material such as polyurethane comprises a sleeve on one strap end with transverse internal teeth and a tongue on the other strap end with complementary nesting teeth, such a construction being shown in Bollinger U.S. Pat. No. 4,615,185, issued Oct. 7, 1986. Such construction requires a sleeve to provide a transverse holding force to maintain the complementary teeth engaged.

Permanent magnets have been suggested in the past for providing a separable clasp for jewelry, animals' collars or the like. For example, Loofboro U.S. Pat. No. 2,648,884, issued Aug. 18, 1953 describes a magnetic clasp of two rigid, two-pole, permanent magnets with an interlocking tongue and groove connection to mechanically lock the sections against relative sliding movement tending to separate the clasp. Another magnetic clasp which is intended to disengage without catching is provided for animal collars as shown in Krebs U.S. Pat. No. 3,589,341, issued June 29, 1971. Still another magnetic clasp for jewelry having two rigid co-acting magnets encased in plastic sheaths discloses a variety of mechanical interlocking protuberances and indentations to prevent sliding separation of the magnetically attracted members.

Holtz U.S. Pat. No. 4,255,837 issued Mar. 17, 1981 and Maehaski U.S. Pat. No. 4,620,725 issued Nov. 4, 1986 each show a pair of sheets of flexible synthetic resin having magnetizable powder therein, permanently magnetized into rows of alternating magnetic polarity providing a holding force between sheets. However, there are no provisions for ridges, protuberances or teeth preventing sliding movement between the magnetically attracted surfaces.

Accordingly, one object of the present invention is to provide an improved flexible strap and clasp attachment for a wristwatch.

Another object of the invention is to provide an improved clasp for a flexible strap which eliminates buckles or other types of protruding members thereby permitting a thinner, more comfortable flexible strap attachment.

Another object is to provide an improved clasp for a wristwatch which is secured, yet easy to engage when desired.

**DRAWINGS**

The invention, both as to organization and method of practice, together with further objects and advantages thereof, will best be understood with reference to the following description, taken in connection with the accompanying drawings, in which:

FIG. 1 is a plan view of a wristwatch and strap as worn on the wrist;

FIG. 2 is an end elevational view of the wristwatch and strap shown in FIG. 1;

FIG. 3 is a side elevational view of one of the flexible strap ends before it is attached to the wristwatch;

FIG. 4 is a plan view of the strap end shown in FIG. 3;

FIGS. 5, 6 and 7 enlarged schematic perspective views of three alternate forms of the improved strap and clasp;

FIG. 8 is an enlarged cross-sectional, elevational view of a strap portion showing an alternate form of the invention;

FIG. 9 is an enlarged cross-sectional elevational view of a strap portion showing yet another form of the invention;

FIG. 10 is an enlarged plan view of another alternate form of the invention showing overlapped strap ends before connection; and

FIG. 11 is a cross-sectional, elevational view taken along lines XI—XI of FIG. 10.

**SUMMARY OF THE INVENTION**

Briefly stated, the invention is practiced by providing a strap having a pair of separable flexible strap ends adapted to curve around the wrist of a wearer and to overlap one another to provide an overlapped section, at least one strap end including at least one ply of thermoplastic material having particles of permanently magnetizable material embedded in the thermoplastic material and magnetized to provide a plurality of rows of alternating magnetic poles, the strap ends having surfaces contacting one another throughout the overlapped section and defining mutually nesting uniformly spaced protuberances and indentations, such as interlocking teeth, whereby the magnetized particles provide a holding force resisting separation of the strap ends, while the nested protuberances and indentations prevent sliding disengaging movement between strap ends. Preferably, the magnetic field is oriented in a longitudinal direction so that when the strap is attached around the wrist, the toroidal path of the magnetic field will reduce stray magnetic flux.

**DESCRIPTION OF THE PREFERRED EMBODIMENT**

Referring now to FIG. 1 of the drawing, a wristwatch shown in FIGS. 1 and 2 of the drawing, includes a watch case 1 with strap attachment lugs 2 and flexible

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