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ADJUSTABLE COUPLING

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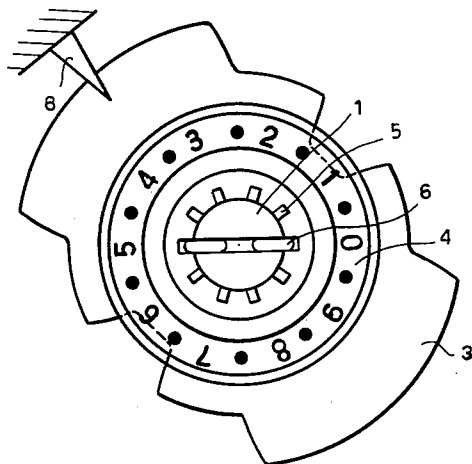


Fig. 2

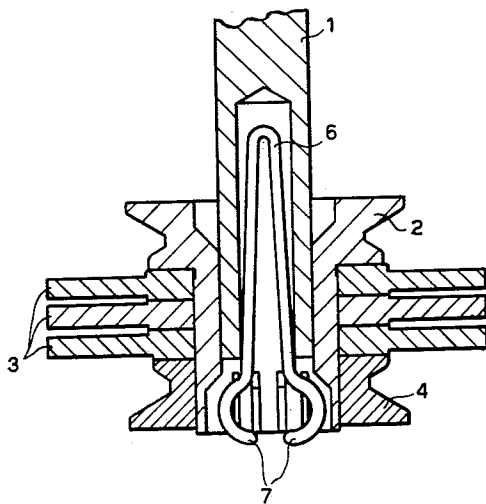


Fig. 1

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7 Claims. (Cl. 287—53)

The present invention relates to adjustable couplings and more particularly to an adjustable coupling, for example, for use in automatic sewing machines.

It is already known that in sewing machines of the so called automatic kind the stitches constituting the embroidery pattern are formed by means of a single cam or cam unit which is removably installed in such a way as to allow substitution thereof and is operated by the machine driving mechanism.

It is also known that the cam or cam unit can be mounted in a single position so that only a single connection thereof with the driving member is possible. Under such circumstances the embroidery may start from any pattern point and it is to be understood that the embroidery may end in general at a different point depending exclusively upon the position of the cam when stopping of the sewing machine has taken place. This is clearly a drawback of such an embroidering system above all when work suspension and resumption in successive steps is required.

An object of the present invention is to provide an adjustable coupling for a cam unit having a plurality of installing positions characterized by a suitable graduation and which enables embroidery to begin at any point of a pattern as required by the operator, with the advantage of being able to resume with accuracy the embroidery pattern of an article which had been worked on and which had been laid aside.

The accompanying drawing given only by way of example shows one of the possible embodiments of the present invention.

In the drawing:

FIG. 1 is a plan view of the cam unit according to the invention, and

FIG. 2 is a front view of the cam unit of FIG. 1.

Referring to the figures, 1 indicates the shaft as operated by the driving mechanism of the sewing machine and arranged in the frame thereof.

The cam unit 3 is inserted on a sleeve or bushing 2 and secured thereto together with the front ring 4.

The bushing 2 is provided with a plurality of radial slots 5 and, together with said cam unit, is fitted on the shaft 1 and is connected to said shaft by means of a resilient stationary fork 6. This fork comprises one but preferably more springy fingers each having an arcuate prong 7 receivable in one of the substantially radial slots 5 provided in that portion of the bushing which extends beyond the free end of the shaft 1. Each finger has a portion projecting into a bore extending inwardly from the free end of the shaft 1, and each of these portions is secured to the shaft.

The front ring 4 is provided with a graduated dial such as illustrated in FIG. 2 and is associated with a pointer 8 secured to the frame of the sewing machine.

When an interruption of the embroidering occurs, the operator has to take note of the graduation mark which is aligned with the pointer before he removes the cam; if he wishes to resume embroidering in the same position of the pattern in which the interruption took place, it is enough that upon adjustment of the cam or cam unit the pointer is again aligned with the same graduation mark through suitable insertion and fastening of the cam or cam unit in the associated notches.

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If an embroidery catalogue with a graduation as above referred to is at the disposal of the operator, it is not necessary that he take note of the graduation mark as he will have the indication of the cam graduation mark to register with the stationary pointer at the work resumption by a comparison of the interruption point of the embroidery pattern with that of the corresponding catalogue pattern.

I claim:

1. A shaft end attachment comprising, in combination, a shaft; a springy finger secured to and extending beyond a free end of said shaft and having an arcuate free end portion located beyond said end of said shaft and having a convex surface directed away from the axis of said shaft and spaced from said axis by a distance greater than the radius of said shaft; and a sleeve into which said shaft slidably extends, said sleeve extending beyond said end of said shaft and being formed in its interior with a groove receiving said arcuate portion of said finger so that the latter connects said sleeve to said shaft in a predetermined angular position with respect thereto.

2. A shaft end attachment comprising, in combination, a shaft; a pair of diametrically opposed springy fingers secured to and extending beyond an end of said shaft, said springy fingers respectively having oppositely curved arcuate portions directed toward each other, said arcuate portions of said fingers having concave surfaces directed toward each other and convex surfaces directed away from each other and said convex surfaces being spaced from the axis of said shaft by a distance greater than the radius of said shaft; and a sleeve into which said shaft slidably extends, said sleeve extending beyond said end of said shaft and being formed beyond said end of said shaft with a pair of internal diametrically opposed grooves respectively receiving said arcuate portions of said fingers so that the latter connect said sleeve to said shaft in a predetermined angular position with respect thereto.

3. A shaft end attachment comprising, in combination, a shaft; a pair of diametrically opposed springy fingers secured to and extending beyond an end of said shaft, said fingers having arcuate free end portions located beyond said end of said shaft and said arcuate free end portion respectively having concave surfaces directed toward each other and convex surfaces directed away from each other and spaced from the axis of said shaft by a distance greater than the radius of said shaft; and a sleeve into which said shaft slidably extends, said sleeve extending beyond said end of said shaft and being formed beyond said end of said shaft with a plurality of pairs of diametrically opposed internal grooves distributed about the axis of said sleeve so that said springy fingers may be selectively received in one of the pairs of diametrically opposed grooves for connecting said sleeve to said shaft in a selected angular position with respect thereto.

4. A shaft end attachment comprising, in combination, a shaft; a pair of diametrically opposed springy fingers secured to and extending beyond an end of said shaft, said fingers respectively having arcuate free end portions located beyond said shaft and said arcuate finger portion respectively having concave surfaces directed toward each other and convex surfaces directed away from each other and spaced from the axis of said shaft by a distance greater than the radius thereof; and a sleeve into which said shaft slidably extends, said sleeve having a free end portion extending beyond said end of said shaft and said free end portion of said sleeve being formed with a plurality of pairs of diametrically opposed axially extending notches in the interior of said sleeve extending from an end of said sleeve located beyond said end of said shaft toward said end of said shaft and said arcuate finger portions being selectively received in one of said pair of

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diametrically opposed notches for releasably connecting said sleeve to said shaft in a preselected angular position with respect thereto.

5. A shaft end attachment comprising, in combination, a shaft formed with an axial bore extending along the interior of said shaft from one end thereof; an elongated substantially V-shaped springy member extending into said bore and having its apex located in said bore, said springy member being secured to said shaft and having a pair of arcuate free end portions located beyond said end of said shaft, respectively having concave surfaces directed toward each other and convex surfaces directed away from each other and spaced from the axis of said shaft by a distance greater than the radius of said shaft; and a sleeve into which said shaft slidably extends, said sleeve extending beyond said end of said shaft and being formed beyond said end of said shaft with at least one pair of diametrically opposed internal grooves receiving said arcuate portions of said member so that the latter connects said sleeve to said shaft in a predetermined angular position with respect thereto.

6. An adjustable coupling comprising, in combination, a rotary shaft; a pair of springy fingers secured to and extending beyond an end of said shaft and respectively having diametrically opposed arcuate portions, said arcuate portions having convex surfaces directed away from each other and spaced from the axis of said shaft by a

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distance greater than the radius of said shaft; and a sleeve into which said shaft slidably extends, said sleeve extending beyond said end of said shaft and being formed in its interior with a pair of diametrically opposed grooves receiving said arcuate portions of said fingers so that the latter removably connects said sleeve to said shaft in a given angular position with respect thereto.

7. An adjustable coupling as recited in claim 6, further comprising a stationary pointer, a dial carried by said sleeve for cooperation with said pointer to indicate the angular position of said sleeve with respect to said shaft, and at least one pair of additional internal grooves formed in said sleeve for selectively receiving said arcuate portions of said fingers so that said sleeve may be selectively connected to said shaft in an angular position with respect thereto indicated by the cooperation of said dial and pointer.

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