# United States Patent [19]

**Griffith**

[11] **3,752,194**

[45] **Aug. 14, 1973**


[54] **LOOM SHEDDING MECHANISM**


[75] Inventor: **John Dalton Griffith,** Littleover, Derby, England

[73] Assignee: **Bonas Machine Company Limited,** Staffordshire, Great Britain



[22] Filed: **Feb. 29, 1972**

[21] Appl. No.: **230,319**

[52] **U.S. Cl.** ..... **139/79,** 139/57

[51] **Int. Cl.** ..... **D03d 5/00**

[58] **Field of Search** ..... 139/79, 78, 82, 88, 139/57, 55, 32, 80



[56] **References Cited**

UNITED STATES PATENTS

| | | | |
|---|---|---|---|
| 3,695,304 | 10/1972 | Menegatto | 139/78 |
| 3,603,351 | 9/1971 | Piazzolla | 139/79 |
| 3,186,440 | 6/1965 | League | 139/88 |
| 2,510,404 | 6/1950 | Lake et al. | 139/82 |
| 3,230,983 | 1/1966 | Egli | 139/82 |
| 2,263,678 | 11/1941 | Cosman | 139/79 |

OTHER PUBLICATIONS

2,024,055 12-1970 German Application (Menegatto) 139-78



*Primary Examiner*—James Kee Chi

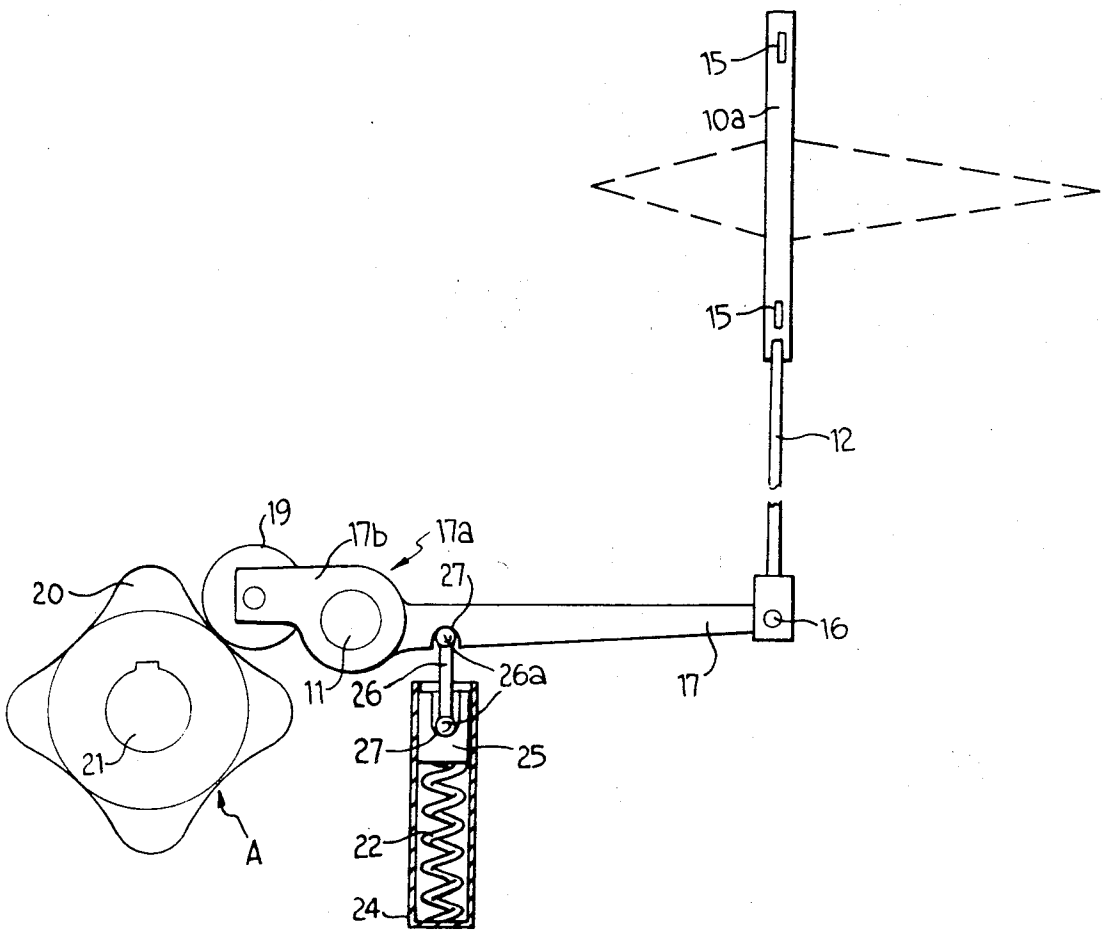
*Attorney*—James E. Nilles



[57] **ABSTRACT**

A heald shaft operating means for a heald shaft of a loom whereby the shaft is operably associated with a pivotal lever arranged to be driven in one directional sense by the action of a cooperating cam means acting upon a follower carried by the lever, and in the opposed directional sense by the action of a compression spring operably associated with the pivotal lever.


**4 Claims, 3 Drawing Figures**



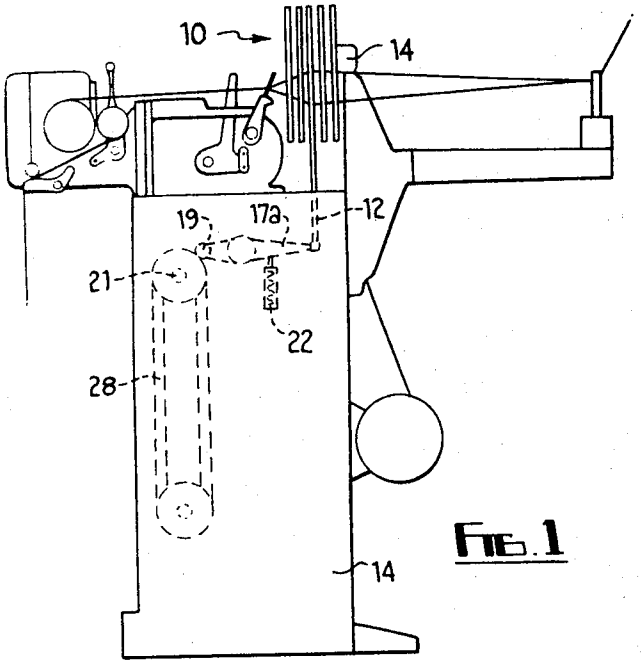



FIG. 1

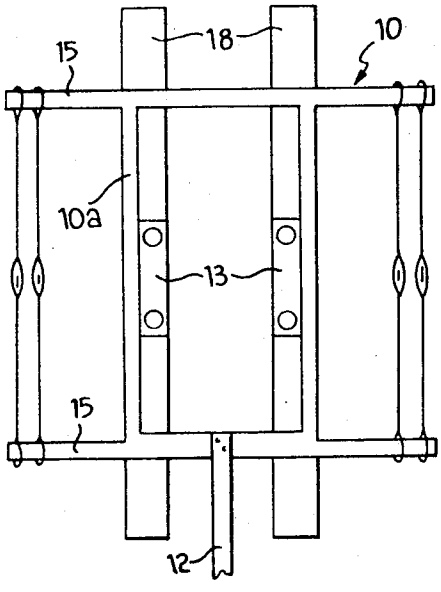



FIG. 3

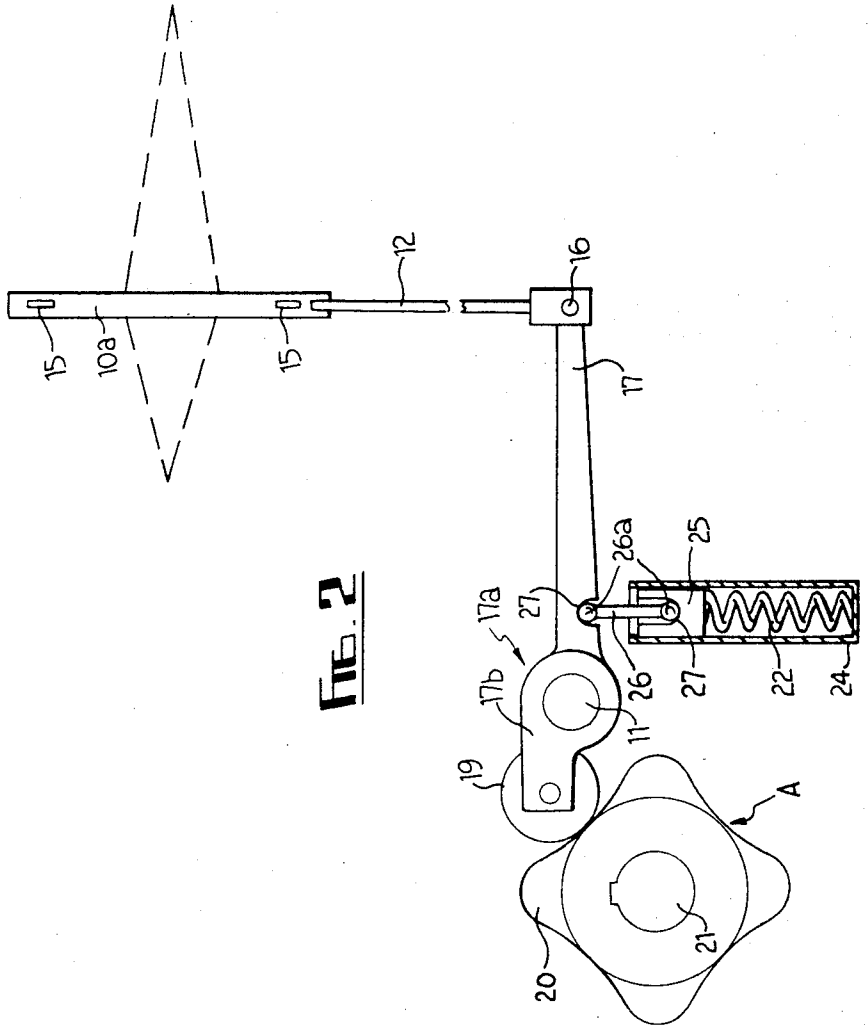



FIG. 2

# LOOM SHEDDING MECHANISM

This invention concerns narrow-fabric weaving looms, and in particular, though not exclusively, a shedding mechanism for such looms.

It is known in some loom constructions for heald shafts to be operated by levers which are held each in contact with the surface of a co-operating cam by means of tension springs located at or near to the extremity of the lever to which the heald shaft is connected. Such an arrangement, whilst being effective, has the disadvantage that the positioning of the spring is such that, in use its amplitude of movement will be relatively large and thus the springs to have a long operative life must be of sturdy construction, and thus comparatively heavy form and this leads to the creation of high inertia forces which tend to limit the speed of operation of the loom to a value lower than that which, in narrow fabric looms in particular, is desirable.

It is the object of the present invention to provide a shedding mechanism which will overcome or at least substantially mitigate the above outlined disadvantages and thus enable the loom to operate at the very high speed demanded by the present-day looms.

According to the present invention there is provided a loom shedding mechanism characterised in that the heald shaft is operably associated with a pivotal lever arranged to be driven in one directional sense by the action of a co-operating cam means acting upon a follower carried by the lever, and in the opposed directional sense by the action of a compression spring operably associated with the pivotal lever.

The invention will now be described further, by way of example only, with reference to the drawings accompanying the Provisional Specification, in which:

FIG. 1 is a schematic side elevation of a loom including a shedding mechanism according to one form of the invention.

FIG. 2 is a detail view on a larger scale of a second form of a loom shedding mechanism, and

FIG. 3 illustrates diagrammatically a heald frame and its manner of mounting in a loom.

Whilst the drawings and following description relate to a narrow fabric loom it is to be understood that the shedding mechanism may be applied to a loom of the kind used for weaving broad fabrics.

As shown in the drawings and in particular FIG. 3 there is provided a heald frame **10** whose vertically disposed elements **10***a* are constrained laterally by short guide blocks **13** mounted on slide elements **18** which guide the frame in its vertical movement. The slide elements **18** are mounted on the loom frame **14.** The guide blocks **13** are, as shown located between upper and lower heald bars **15** and thus must be short enough to allow for unrestricted vertical movement of the heald frame **10** between upper and lower shed positions. A connecting rod **12** is rigidly attached at its upper end to heald frame **10** and pivotally connected in the transverse plane at its lower end to the extremity **16** of one arm **17** of a pivotal lever **17***a*. The connecting rod **12** has sufficient inherent flexibility to accommodate for the arcuate displacement of the lever extremity **16** when the loom is in use. The pivotal lever **17***a* has as its fulcrum a pivot shaft **11** and extending from this fulcrum in a direction opposite to arm **17** is a short arm **17***b* provided at its end with a cam follower **19** in the form of, for example a roller. The follower member **19** is caused as shown in FIG. **2,** to make contact with the surface of a co-operating cam **20** mounted on a camshaft **21** journalled in the loom frame **14** and driven at an appropriate speed from the loom main shaft (not shown). The contact of follower **19** with cam **20** is maintained by use of a compression spring **22** acting on the arm **17** of pivotal lever **17***a* at close proximity to pivot shaft **11** (that is at a distance from the pivot shaft **11** no greater than the distance of the axis of the cam follower **19** from the pivot shaft **11**). Compression spring **22** is guided and provided with a re-action face by sheath block **24** mounted on the loom frame **14.** A slidable piston **25** abuts the free end of the compression spring **22** and is provided with a push rod **26** having spherical formed ends **26***a* which are seated in mating spherical depressions **27** formed in both the piston **25** and the arm **17.** Because of the close positioning of the cam follower **19** and compression spring **22** to the pivot shaft **11** the moment of inertia of the pivotal lever **17***a* about its fulcrum will thereby be kept to a low value, as will the bending moment which will be induced upon the arm **17** of the pivotal lever **17***a* only by the load derived from moving the heald frame mass and not by the force of the compression spring **21** and hence the proportions and thus the mass of this arm **17** can advantageously be somewhat less than is the case in known looms. Furthermore, the oscillations of the compression spring **22** will be of small amplitude due to the proximity of the spring to the fulcrum of lever **17***a* as will be the movement of the piston **25** and push rod **26** thereby keeping to a low value the inertia force deriving from these components and thus enabling very high operating speeds to be achieved.

As indicated in FIG. **1** the cam **20** may be replaced by a chain **28** the links of which are so formed as to produce a cam surface so that large pattern repeats can be achieved.

The invention is not restricted to the details set out above. For example, the dispostion of the follower **19** and spring **22** relative to the pivot shaft **11** can be altered to give the same effect. Details of such modifications will suggest themselves to persons skilled in the art of loom construction and thus it is not thought to be necessary to set these out in detail in this specification.

I claim:

**1.** A loom shedding mechanism comprising; a heald shaft; a lever pivotal about a fulcrum and operatively associated with said heald shaft; a follower carried by said lever; cam means cooperating with and acting upon said follower for driving said lever in one directional sense; a compression spring operatively associated with said lever for acting upon said lever in an opposed directional sense; the said follower and the said compression spring being positioned on opposite sides of said fulcrum with the compression spring in close proximity to the said fulcrum and a piston and push-rod assembly by means of which said compression spring acts upon said pivotal lever.

**2.** A loom shedding mechanism according to claim **1** including a cylinder in which said compression spring and said piston are mounted, said push rod extending between said piston and said lever.

**3.** A loom shedding mechanism as claimed in claim **1** in which the push rod is provided with partly spherical ends seated respectively in corresponding receiving formations in said piston and said lever.

4. A loom shedding mechanism according to claim 1 wherein said heald shaft comprises: a movable heald frame having spaced heald receiving bars; a connecting rod connected to said lever and to said heald frame; a heald frame guide means to constrain said heald frame in a fore and aft direction and being of such dimensions that said heald frame is retained between said guide means throughout its entire range of movement; and guide blocks mounted upon said heald frame guide means between said spaced heald receiving bars for constraining said heald frame from lateral movement.

* * * * *