July 29, 1941. W. R. HEWTON 2,250,866

WEFT END CONTROL MEANS

Filed June 6, 1939 2 Sheets-Sheet 1

FIG. IV.

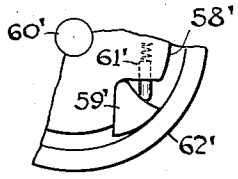


FIG. I.

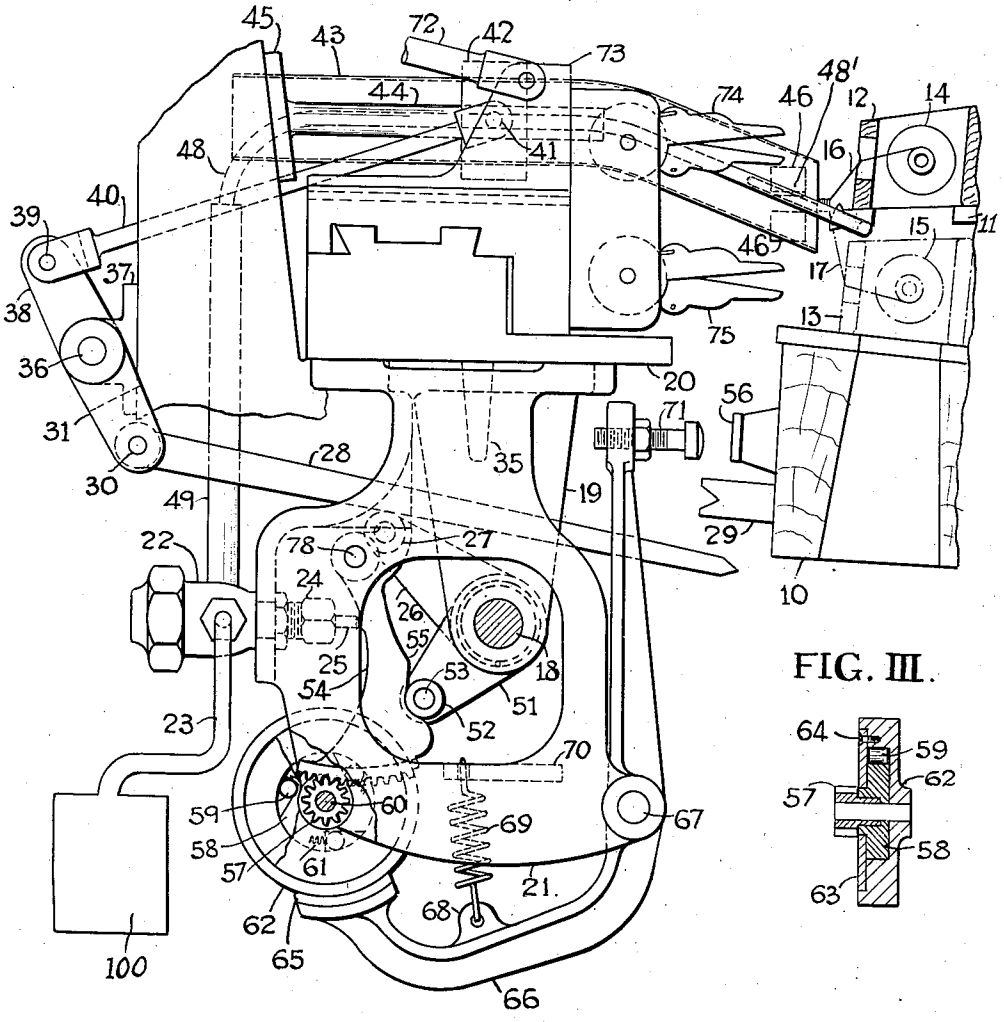


FIG. III.

INVENTOR
WILLIAM R. HEWTON.
BY Paul J Schmitz
ATTORNEY

July 29, 1941. W. R. HEWTON 2,250,866

WEFT END CONTROL MEANS

Filed June 6, 1939 2 Sheets-Sheet 2

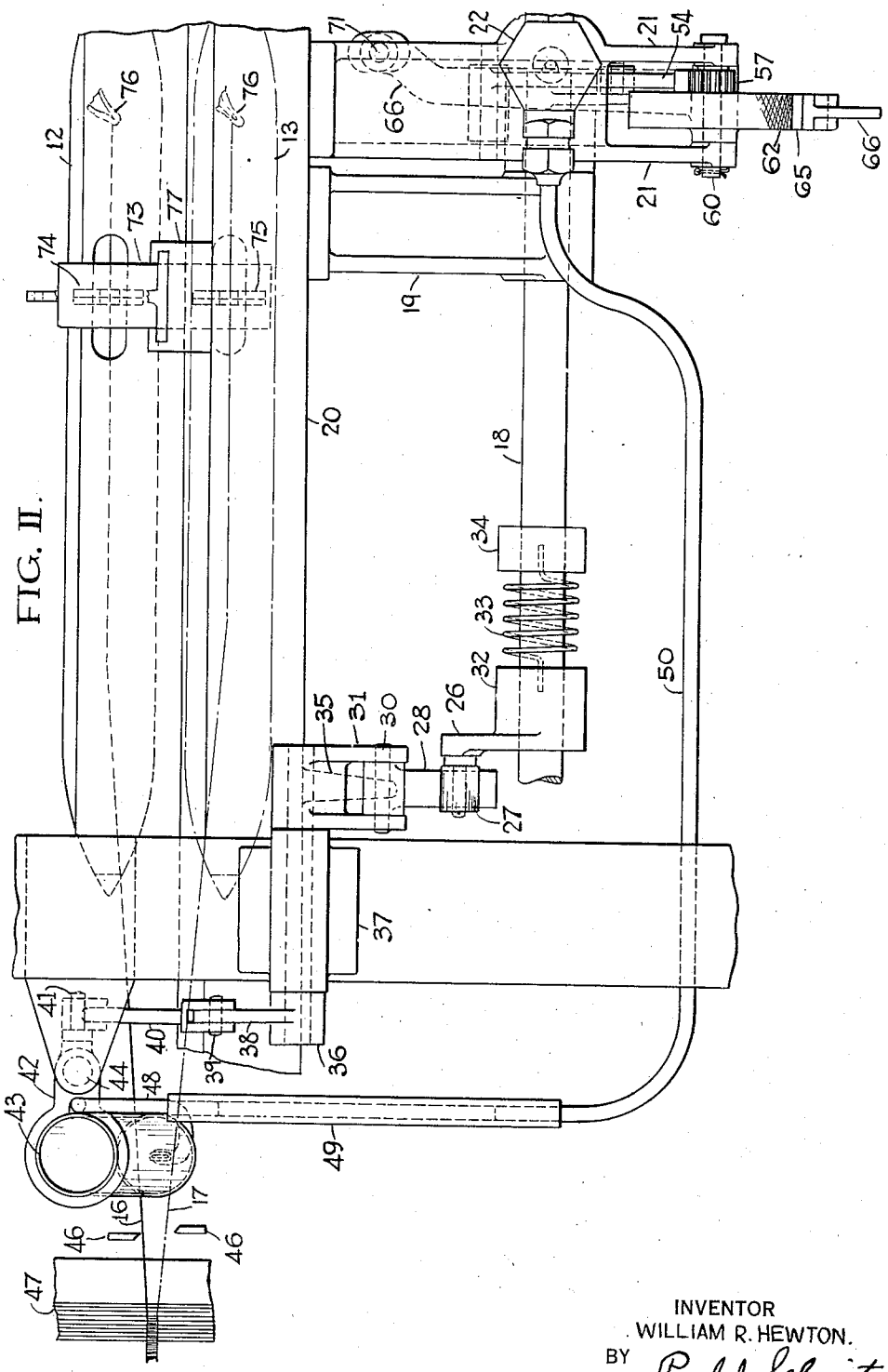


FIG. II.

INVENTOR
WILLIAM R. HEWTON.
BY Paul J Schmitz
ATTORNEY

Patented July 29, 1941

2,250,866

UNITED STATES PATENT OFFICE

2,250,866

WEFT END CONTROL MEANS

William R. Hewton, Philadelphia, Pa., assignor to Collins & Aikman Corporation, Philadelphia, Pa., a corporation of Delaware

Application June 6, 1939, Serial No. 277,575

15 Claims. (Cl. 139—256)

This invention relates to a pneumatic thread catcher and control means for looms and is particularly designed for use on looms of the bobbin replenishing type. Such looms are provided with feeler or other weft detecting devices and means are provided to dispose of the weft thread which extends from the selvage to the ejected bobbin.

It is known to provide a quick acting thread cutter adjacent to the end of the shuttle box or the shuttle eye effective to sever the thread simultaneous with the ejection of the bobbin. This operation, however, still leaves a loose weft end extending from the thread cutter to the selvage. A temple or other means has therefore been provided with a cutter for severing this weft end close to the selvage and devices have been provided for transporting the detached portion of weft to a point removed from the fell of the cloth.

It is further known to provide a suction tube and related parts which causes the loose weft end to remain gripped in said tube until the next operation of the transfer mechanism, as disclosed in Letters Patent No. 1,220,667 issued to Benjamin F. McGuiness on March 27, 1917.

According to my improvements I eliminate the possibility of the detached portions of weft being carried into the shed after they are severed by the cutter. While my improvements are not limited to double shuttle looms, they are especially desirable in replenishing looms of this type weaving with cross pick shuttles, as in plush weaving. The detached thread from a shuttle replenished in either of two compartments can be disposed of by a single mechanism.

I accomplish this by positioning a tube member having open ends, one of which is transversely of the path of both weft ends. A controlled air pressure forces the weft end into the tube and the pressure is maintained until after the selvage cutter has severed the weft end near the selvage, whereupon the end is completely removed from the loom within a few picks of the transfer pick.

The tube member is conveniently positioned several inches from the selvage of the cloth and is slideable on a fixed portion of the loom. A pneumatic valve operated by depression of an externally protruding plunger controls the air pressure, which may be from an outside source supplying a number of looms. The operation of the valve may be controlled in part by the loom elements, which are set to effect transfer by the call for replenishment. The length of time that air pressure is maintained can be adjusted to the position of the selvage cutter and controlled by the reciprocation of the lay in a manner hereinafter more fully set forth.

An object of this invention is to provide a pneumatic thread catching device having an air supply for a single or a plurality of looms.

Another object is to provide pneumatic weft control means which will quickly transfer a severed end away from the fell of the cloth.

Another object is to provide adjustable control means for a pneumatic weft catcher which operates on the transfer pick and continues to function until after the weft is severed at the selvage.

Another object is to control the timing of the pneumatic valve from the reciprocating lay of the loom.

Another object is to provide a single mechanism for controlling the loose ends of threads from shuttles replenished in different compartments of a double shuttle loom.

These and other objects of invention will be manifest from the following description and drawings, in which,

Fig. I is a side elevational detail assembly view, partly in section, of an embodiment of my invention in its environment of related loom parts.

Fig. II is a front elevation, looking toward the rear of the loom and showing the position of the selvage of the cloth with respect to my improvements.

Fig. III is a detail assembly in section of a portion of the valve control mechanism.

Fig. IV is a modification of the mechanism illustrated in Fig. III.

Referring to the drawings in which like parts are designated by like numerals in the different figures, Fig. I illustrates my improvements on a replenishing loom in which the oscillating lay 10 supports a double shuttle box 11 for upper shuttle 12 and lower shuttle 13. The shuttle bobbins 14 and 15 carry threads 16 and 17 through superposed warp sheds in a known manner. It is to be understood that the shuttles may be simultaneously picked from opposite sides of the loom in order that only one shuttle will be on the replenishing side at any given time. The substantially exhausted bobbin of either the upper or lower shuttle passes down through a slot in the lay as transferrer T inserts a new bobbin.

On a fixed portion of the loom frame forwardly of the lay is a replenishing shaft 18 supported by brackets such as 19 which are suspended from the under side of the knife rail 20. The replenishing shaft operates in a known manner as fully set out in Letters Patent of U. S. No. 2,136,331.

The shaft turns clockwise one of two distances after the call for replenishment of an exhausted or partially exhausted shuttle. The extent of movement is determined by which shuttle is to be replenished and a latch mechanism (not shown) is provided to hold the shaft in proper position for transfer similarly to the disclosure of the patent.

The master bracket 21 which is also fixed to the underside of the knife rail 20, serves as a support for a normally spring closed pneumatic valve 22, and its controlling parts. The valve 22 is connected to a central or unitary air supply 100 by tube 23 and has a screw head housing 24 for a spring (not shown) which normally keeps the valve tip 25 extended and the weft control mechanism cut off from the source of air.

When bobbin change is to be effected, the shaft 18 turns clockwise and through arm 26 and roller 27 lifts the dagger 28 into alignment with the bunter 29. The dagger 28 is pivotally supported at 30 on link arm 31. Arm 26 is loosely mounted on shaft 18 and is integral with the hub 32. A spring 33 has one end secured to fixed collar 34 and its other end secured to hub 32. A stop 35 secured to the knife rail 20 insures that the dagger 28 will be in alignment with the bunter on either the long or short movement of the shaft 18. On the longer movement, the shaft 18 turns in the hub 32 after the dagger engages the stop 35. A lesser relative movement may occur on the shorter movement of the shaft.

The arm 31 is secured to a short shaft 36 mounted for turning in journal bracket 37. Arm 38 also secured to the short shaft 36 has pivoted thereon as at 39, a link 40 which connects the arm to the pin 41 which is on extension 42 and is integral with the pneumatic tube 43. A guide 44 having a fixed offset portion 45 supports the extension and tube. It is thus apparent that clockwise movement of the shaft 18 (Fig. I) will result in a rearward movement of the pneumatic tube 43 after the call for replenishment and as the lay 10 advances to front center.

Cutters 46 are diagrammatically shown clear of the path of the loom reed 47 and positioned for cutting either weft end after replenishment. The cutters 46 sever the end leading from the selvage several picks after replenishment. The pneumatic valve 22 is open and air is passing through the tube 43 until after this second severance of the weft.

Fixed to the pneumatic tube 43 is a smaller tube 48 which is connected to the valve 22 through flexible rubber tube 49 and copper or other tubing 50. Tube 48 has a reverse bend the end of which is near the free end of tube 43. Air passing through tube 48 creates a suction within the tube 43. The tube 43 may be slit, as at 48', for a short distance on the side nearest the selvage (Fig. I) to better insure the weft end being clear of the shuttle box or other loom parts before the selvage cutter cuts it. The rearward movement of the pneumatic tube positions the tubes nearer to the path of the weft or wefts to be disposed of although rearward movement of the pneumatic tubes is not essential to the broad concept.

An arm 51 fixed to the shaft 18 and carrying roller 52 on a pin 53 near its free end on turning of shaft 18 causes gear arm or depressor 54 to pivot about pin 78 and to compress valve tip 25 so as to admit air to pneumatic tube 43 through the tube connections 48, 49, and 50. The gear arm 54 is so designed that it will be moved the same extent on both movements of the shaft 18. This is accomplished by providing a high point 55 on the gear arm 54. Movement greater than the short movement of shaft 18 in a clockwise direction merely causes the roller 52 to hold gear arm 54 in the same position as when the roller contacts the high point 55 at the extremity of the short stroke.

The valve control gear and its assembly are designed to hold the valve 22 open and air flowing through tubes 43 and 48 until released by the lay bunter 56 after both severances of the weft end. The gear arm 54 on movement of shaft 18 turns the gear 57, plate 58 and the rollers 59 counter clockwise about pin 60. Springs 61 positioned in recesses or notches of plate 58 tend to force the rollers 59 counter clockwise about pin 60 and hence the rollers move relatively freely within the housing 62 when the gear 57 is rotated counter clockwise. Clockwise movement of the gear 57, plate 58 and rollers 59 will be resisted by housing 62 which carries retaining plate 63 secured to the housing as by screws 64. This resistance to clockwise movement by the housing 62 is caused by the rollers 59 being wedged between the inner surface of the housing and the ascending surfaces of the notched or recessed plate 58.

Wedge 59' (Fig. IV) may be substituted for each of the rollers 59. In this case pin 60' supports the recessed plate 58' and spring pins 61' prevents a reversal of movement of the plate 58' from its direction of free movement without positively turning the housing lug 62'.

A brake shoe 65 secured to the brake arm 66 prevents the knurled housing 62 from clockwise rotation during application. The brake arm 66 is pivoted at 67 and has a perforated ear 68 which serves as a connection for the spring 69. The spring is also secured to projection 70 on the master bracket 21.

Adjustable screw 71 is aligned with the bunter 56 and the brake shoe 65 is momentarily released from the housing 62 as the oscillating lay 10 reaches its front center position. Several blows by the bunter, one after each pick, will permit the valve 22 to completely close and the gear arm 54 to return to its normal position. The valve spring inside valve 22 constitutes the actuator.

A link 72 connects cutter carriage 73 and moves the cutters 74 and 75 rearwardly to sever the weft near the shuttle eyes 76 in the manner disclosed in the beforementioned U. S. Letters Patent No. 2,136,331. The carriage 73 is slideable in guide 77 and the shear cutters are cammed together in a known manner. These cutters effect the first severance of the weft end and the valve 22 remains open until after the operation of the selvage cutter 46.

From the foregoing it is clear that I have provided an improved weft control device in which the call for bobbin replenishment initiates a severance of the weft near the shuttle eye subsequent to the opening of a pneumatic valve. Air passing through the valve causes the severed end to be inserted in a pneumatic tube and finally disposed of before the pneumatic valve is closed.

Having described my invention in a preferred embodiment, I claim:

1. In a weft replenishing loom having means to sever the outgoing weft at different times at two separated points and a pneumatic device to remove the detached end, the combination of parts which include a pneumatic tube having one end adjacent the path of the weft outside the weaving shed at a point between the points

of severance, means to force air through the tube in a direction to move the detached weft end through the tube, and air flow control means to initiate the flow of air and to stop the flow of air through the pneumatic tube after the weft has been severed at both points, said air flow control means comprising a valve and a valve actuator which operates the valve after the indication for replenishment.

2. In the combination set forth in claim 1, guide means for the pneumatic tube and means for moving the tube rearwardly after the call for replenishment.

3. In a combination as set forth in claim 1, further characterized in that the pneumatic tube is slit on the side closer to the selvage.

4. In a weft replenishing loom having means to sever the outgoing weft at different times at two separated points and a pneumatic device to remove the detached end, the combination of parts which include a pneumatic tube having one end adjacent the path of the weft outside the weaving shed at a point between the points of severance, means to force air through the tube in a direction to move the detached weft end through the tube, and air flow control means to initiate the forcing of air through the pneumatic tube before the weft is severed and to stop the forcing of air through the pneumatic tube after the weft has been severed at both points, said air flow control means comprising a valve and a valve actuator which operates the valve after the indication for replenishment.

5. In a loom having weft replenishing means, means to sever the outgoing weft at different times at two separated points and a pneumatic device to remove the detached end, the combination of parts which include a pneumatic tube having one end adjacent the path of the weft outside the weaving shed at a point between the points of severance, means to force air to flow through the tube in a direction to move the detached weft end through the tube, and air flow control mechanism including a valve, means for opening the valve after the call for action of the replenishing means to initiate air flow in the pneumatic tube, and means for closing the valve after a pre-determined number of picks.

6. In a loom having weft replenishing means, means to sever the outgoing weft at different times at two separated points and a pneumatic device to remove the detached end, the combination of parts which include a pneumatic tube having one end adjacent the path of the weft outside the weaving shed at a point between the points of severance, means to force air to flow through the tube in a direction to move the detached weft end through the tube, and air flow control mechanism including a self-closing valve, means for opening the valve after the call for action of the replenishing means to initiate air flow in the pneumatic tube, and lay operated means for permitting the self-closing of the valve only after a pre-determined number of picks.

7. In a loom having weft replenishing means, means to sever the outgoing weft at different times at two separated points and a pneumatic device to remove the detached end, the combination of parts which include a pneumatic tube having one end adjacent the path of the weft outside the weaving shed at a point between the points of severance, means to force air to flow through the tube in a direction to move the detached weft end through the tube, and air flow control mechanism including a self-closing valve and means including a one-way clutch device for opening the valve after the call for replenishment to initiate air flow through the pneumatic tube and for permitting the self-closing of the valve only after a pre-determined number of picks.

8. In a double shuttle replenishing loom in which an upper shuttle and a lower shuttle are replenished by the same transferrer and each outgoing weft is severed at two separated points, the combination of a pneumatic device to remove the detached ends, which includes a pneumatic tube having one end adjacent the paths of the wefts of both shuttles at a point outside the weaving shed and between the points of severance, means to force air through the tube to move a detached weft end of either shuttle through the tube, and air flow control mechanism including a valve, means for opening the valve after the call for action of the transferrer to initiate air flow into the pneumatic tube and means for closing the valve after pre-determined number of beats of the lay.

9. In a loom as set forth in claim 8, further characterized in that an air flow control means maintains the time of flow of air equal for the disposal of the detached weft end from each bobbin.

10. In a weft replenishing loom having means to sever the outgoing weft at different times at two separated points and a pneumatic device to remove the detached end, the combination of parts which include a pneumatic tube having one end adjacent the path of the weft outside the weaving shed at a point between the points of severance, means to force air to flow through the tube in a direction to move the detached weft end through the tube, and air flow control mechanism including a valve with a self-closing valve stem, a depressor for the valve stem to open the valve, a depressor actuator, depressor holding means to hold the valve stem and depressor in depressed position, and means to engage the depressor holding means to effect release of the depressor, whereby the self-closing valve returns to closed position.

11. In a weft replenishing loom having means to sever the outgoing weft at different times at two separated points and a pneumatic device to remove the detached ends, the combination of parts which include a pneumatic tube having one end adjacent the path of the weft outside the weaving shed at a point between the points of severance, means to force air to flow through the tube in a direction to move the detached weft end through the tube, and air flow control mechanism including a valve with a self-closing valve stem, a depressor for the valve stem to open the valve, a depressor actuator, depressor holding means to hold the valve stem and depressor in depressed position, and means to intermittently engage the depressor holding means to effect release of the depressor, whereby the self-closing valve returns to closed position.

12. In a weft replenishing loom having means to sever the outgoing weft at different times at two separated points and a pneumatic device to remove the detached end, the combination of parts which include a pneumatic tube having one end adjacent the path of the weft outside the weaving shed at a point between the points of severance, means to force air to flow through the tube in a direction to move the detached weft end through the tube, and air flow control mechanism including a valve with a self-closing valve

stem, a depressor for the valve stem to open the valve, a depressor actuator, depressor holding means to hold the valve stem and depressor in depressed position, and means on the lay to intermittently engage the depressor holding means to effect release of the depressor, whereby the self-closing valve returns to closed position.

13. In a loom as set forth in claim 12, further characterized in that the holding means for the valve stem and depressor includes a sector gear movable with the depressor and a one-way clutch device.

14. In a loom as set forth in claim 12, further characterized in that the holding means for the valve stem and depressor includes a sector gear movable with the depressor, a one-way clutch device and a brake, said brake engaging a portion of the one-way clutch which does not move on the depression movement of the valve stem but does move under the action of the self-closing valve stem when the brake is removed, whereby the valve is closed.

15. In a loom as set forth in claim 12, further characterized in that the depressor actuator comprises an arm on a shaft movable after the call for replenishment, and in that the holding means for the valve stem and depressor includes a sector gear movable with the depressor, a one-way clutch and a brake, said brake engaging a portion of the one-way clutch which does not move on the depression movement of the self-closing valve but moves under the pressure of the valve stem when the brake is removed, whereby the valve is closed.

WILLIAM R. HEWTON.

CERTIFICATE OF CORRECTION.

Patent No. 2,250,866. July 29, 1941.

WILLIAM R. HEWTON.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, first column, line 12, before "valve" second occurrence, insert --self-closing--; line 16, for "tip" read --stem--; page 2, second column, line 32, strike out the word "lug"; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 23rd day of September, A. D. 1941.

(Seal)

Henry Van Arsdale,
Acting Commissioner of Patents.