

HOE *ET AL.* V. CRANSTON.

*Circuit Court, D. Connecticut.*

June 28, 1890.

1. PATENTS FOR INVENTIONS—PATENTABILITY—INVENTION.

Letters patent No. 216,787, issued June 24, 1879, to George C. Gill for an improvement in apparatus for stopping and reversing machinery, consisting of two pulleys on the driving shaft, one fast and one loose, a belt, with a fork and lever for shifting it, and a vibrating frame, carrying a frictionally acting wheel, the shaft of which is geared with the loose pulley, are not invalid for want of invention.

2. SAME—INFRINGEMENT.

Said patent is infringed by a device which differs from the patented machine only in using a friction wheel instead of a cog-wheel in the gearing.

In Equity.

*M. H. Phelps*, for complainants.

*Frederick E. Tasker* and *Donald G. Perkins*, for defendant.

SHIPMAN, J. This is a bill in equity to restrain the defendant from the alleged infringement of letters patent No. 216,787, dated June 24, 1879, to George C. Gill, assignor to R. Hoe & Co., for an improvement in apparatus for stopping and reversing machinery. The apparatus is designed to be used mainly upon printing-presses, and to enable the operator to quickly stop and reverse the press if a sheet of paper has been improperly fed to it. The description of the improvement which is contained in the specification cannot be understood without constant reference to the drawings, and I there fore use, slightly abbreviated, the clear description which is contained in the testimony of the plaintiff's expert, Mr. Henry B. Renwick:

“There are many machines which require to be reversed or have their wheels turned in opposite directions or stopped, while the motor shaft is always revolving in the same direction. The Gill invention performs this duty by the aid of only two pulleys on the driving shaft, and a single belt, capable of transferring the motion of the motor shaft to the driving shaft. On the driving shaft there are two pulleys. The one nearest to the frame of the printing-press is a fast pulley, keyed upon the shaft. The outer pulley on this driving shaft is a loose pulley; that is, one free to revolve upon the shaft as a journal, or one which will permit the shaft to revolve in either direction while the pulley stands still. A belt connects the motor shaft with either pulley on the driving shaft at the will of the attendant; the belt being shifted by means of a shifting lever, which carries a fork that embraces the belt. When the fork is shifted into its position nearest the frame of the printing-press, the lower part of the belt is on the fast pulley, and when this fork is in the position furthest from the machine the belt is shifted upon the loose pulley. In order to reverse the motion of the driving shaft, as the fast and loose pulleys both revolve in the same direction under the operation of the motor shaft, it was necessary to make some connection between

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the loose pulley and the driving shaft, so that the revolution of the loose pulley should drive the driving shaft in a direction opposite to that of the loose pulley and of the motor shaft. Mr. Gill devised means, combined with the pulleys and shafts and belt, which will perform this duty. On the left-hand side of the fast and loose pulleys of the driving shaft there is mounted what the patent calls a 'vibrating frame.' This frame carries a shaft which has at one end a friction wheel or friction gearing, and at the other end a cog-wheel, [this friction

gearing is the wheel 22 of the 3d claim,] and there is provided in the machine a lever, by means of which this vibrating frame can be vibrated by the hand of an attendant; its range of vibration being so great that at one time the friction gear carried by the vibrating frame shall be in gear with a friction surface making part of the fast pulley on the driving shaft, and that, when the vibrating frame is moved in the other direction, said friction gear in the vibrating frame will be out of contact with the friction surface on the fast pulley. Now if, when the friction surfaces are in contact, that one on the vibrating frame could be driven in the same direction as the loose pulley is driven, and by motion derived from the loose pulley, then the fast pulley would be driven in the opposite direction to the loose pulley, and the motion of the driving shaft and the machine would be reversed. In order to perform this duty, Mr. Gill secured to the loose pulley, so that it would turn with it, a cog-wheel, and this cog-wheel gears into another cog-wheel, and this second cog-wheel gears into a third cog-wheel, which latter is the wheel that is carried by the vibrating frame. In consequence of this construction, the shaft upon the vibrating frame, with its friction gear, revolves in the same direction as the loose pulley. If we now suppose the belt shifted upon the fast pulley, then the fast pulley and the driving shaft will be driven, what I call, 'ahead.' Now, if it be desired to stop the machine, the attendant shifts the belt to the loose pulley, when it will be revolved aimlessly, and the driving shaft will stand still. If he now desires to turn the driving shaft and the fast pulley in the opposite direction, he brings the vibrating frame into such position that the friction gear supported by it will engage with the friction surface on the fast pulley. Then the loose pulley will no longer revolve aimlessly, but, by means of the gearing before described, will drive the fast pulley and the driving shaft in the opposite direction from that in which the loose pulley is being driven, thus reversing the motion of the driving shaft and of the machine. If it be now desired to stop the machine, all that is necessary is to shift the position of the vibrating frame so that the friction gear there on is out of contact with the fast pulley, and the machine and driving shaft will stop, although the loose pulley still revolves. If it be now desired to make the machine go ahead again, the belt is, by means of the shipper and fork, shifted from the loose to the fast pulley; and it will be noticed that these three operations are performed by the use of a single pulley on the motor shaft, of a single belt, and of only two pulleys, one fast and one loose, on the driving shaft."

The second and third of the five claims of the patent are alone said to be infringed, and are as follows:

"(2) The combination, with the belt, 13, the driving shaft, and its fast and loose pulleys, of the vibrating frame, carrying a frictionally-acting wheel, and gearing connecting the shaft of said wheel with the loose pulley, substantially as described. (3) The combination, with the belt, 13, and a device for shifting the same, of the driving shaft, 20, fast and loose

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pulleys, and a vibrating frame carrying a wheel, as 22, the shaft of which is geared with the loose pulley, all substantially as described.”

The elements which are combined in the third claim are the belt, a device for shifting the belt, which is the fork and lever, the driving shaft, a fast pulley, and a loose pulley; the vibrating frame carrying a friction gear, which engages with a friction surface attached to or making part of the fast pulley, the shaft of the frame being geared with the loose pulley by means of gearing, substantially such as is described, so that the friction gear revolves in the same direction as the loose pulley. The

elements of the second claim are the same, with the exception of the fork and lever. The printing-press of the defendant has a belt, a fork and lever for shifting the belt, a driving shaft a fast and a loose pulley, a vibrating frame carrying a shaft provided at one end with a friction gear and at the other end with a cog-wheel. The vibrating frame can be moved towards and away from the fast pulley, and when it is nearest to the pulley its friction gear is in contact with the surface of the fast pulley. The shaft on the vibrating frame is driven from the loose pulley, being so geared with it that the friction gear revolves in the same direction as the loose pulley. A cog, called in the case "the small iron cog," is driven from the loose pulley by friction gearing, viz., the friction surface of the loose pulley and a little pulley keyed upon the same shaft as the cog, and this iron cog gears into a cog-wheel on the vibrating shaft. The apparatus, which was patented to the defendant in 1883, is the same as the plaintiffs' except as to the means for driving the iron cog. In the plaintiffs' device this cog is driven by another cog keyed to the loose pulley, instead of by friction gearing.

The important question in the case is that of patentability. The defendant does not insist that the particular combination existed before the Gill invention, but that stopping and reversing mechanism was well known, and consisted of fast and loose pulleys, a shifting device, gears which transmitted motion, so that the driving shaft should be driven in a reverse direction, for which purpose a vibrating frame had been used, and there fore, whenever it was required in a particular machine to stop and reverse, the skilled mechanic knew how to adapt his machine to the necessities of the particular case. These general statements in regard to the elements of the combination are true, but it is necessary to look more closely into the history of the art, to see what had been reached, and thence to ascertain whether the character of the new combination was such as to be within the scope of mere mechanical knowledge and of expected skillful adaptation of known means to ends.

The defendant introduces the stopping and reversing mechanism in divers existing machines, books, and patents which show the state of the art in machines of this kind before the Gill invention. The C. B. Rogers & Co., the Hopkins & Allen, and the Sibley planers, the Tilton and the Soger patents, have no vibrating frame, but, as a consequence, have three pulleys, so that the belt may be easily transferred from the fast to the loose pulley. In the "Model of Lathe Head" the revolution of the lathe spindle can be made at different velocities, and can be stopped, but cannot be reversed. It has but one pulley, and cannot be altered so as to reverse the motion of the shaft, without making a new and different machine. No. 59 in "Brown's Mechanical Movements" is also for using a shaft with varying velocities, and has three pulleys and no vibrating frame. The mechanism of the "Sibley Lathe Head" both stops and reverses the motion of a shaft. It has one pulley, and of course no shipper. It has a vibrating frame which carries two sets of gears,—one for

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moving the shaft in one direction, and the other for moving it in another direction. The Williamson patent is the only other patent relied upon in the argument.

It has no reversing apparatus. There is thus no mechanism Which both stops, starts, and reverses a machine by the use of two pulleys, one fast and one loose, and a vibrating frame which throws in and out of operation a single set of gears, which, when put in motion by the loose pulley, cause the fast pulley to revolve in the opposite direction to the loose pulley. The Gill mechanism is a simple and compact method of stopping and reversing, has but one train of reversing gear, and gives the operator prompt and easily-managed control of the press. The important elements which give the combination its superiority are the vibrating frame and the friction gear, which acts upon the friction surface of the fast pulley, or, as they are called in the second claim, "the vibrating frame, carrying a frictionally acting wheel." The elements of the combination have never been thus brought together before, and the arrangement produces an important result, without unnecessary wear and tear, and without loss of power, and by a simple and economical combination of parts, which is easily managed. This combination in the use of the vibrating frame and its frictional wheel seems to me to have been the result of invention, and to have been beyond the scope of mere mechanical skill.

Upon the question of infringement, the only difference which is claimed by the defendant's expert to be of importance is that, instead of the cogwheel, 10, in Gill's machine, the defendant uses a friction wheel, which is driven by the surface of the loose pulley, and transmits motion to the iron cog. These two kinds of gearing were, in the place and for the purpose for which they were there used, known equivalents or substitutes for each other, and, unless a most narrow construction should be given to the Gill patent, they create no difference between the two devices.

Let there be a decree against the defendant for the infringement of the second and third claims, and an accounting.