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CARDING ENGINES

Filed Nov. 18, 1958

Fig. 1.

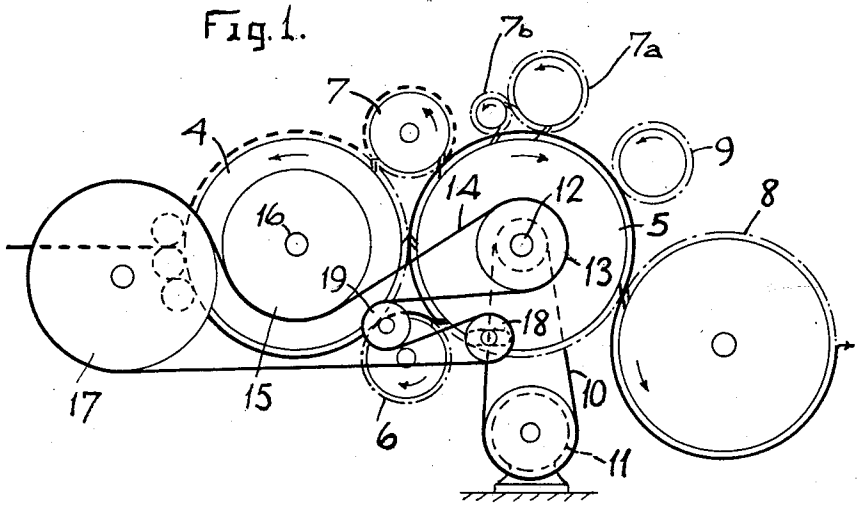


Fig. 2.

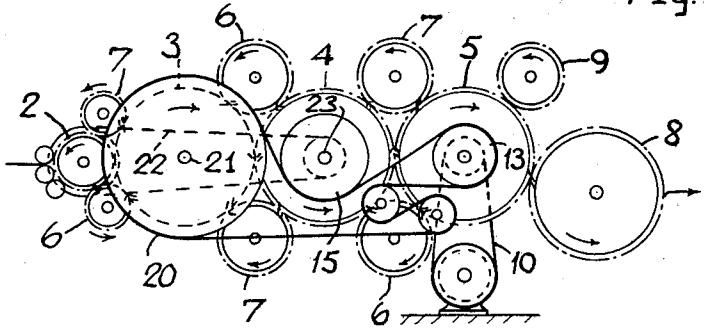
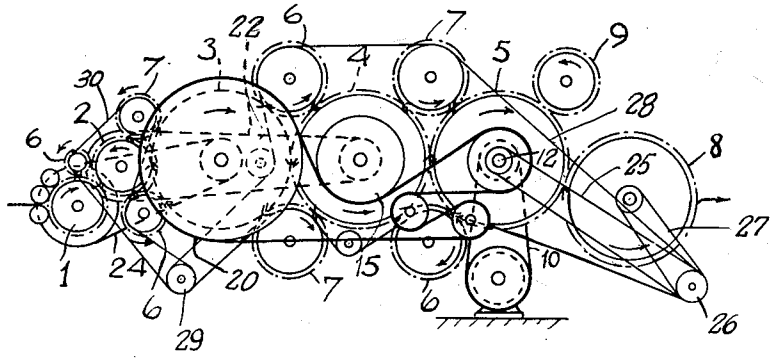


Fig. 3.



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3,087,202

CARDING ENGINES

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2 Claims. (Cl. 19—99)

This invention relates to carding machinery.

The mechanical carding process comprises the progressive breaking-down to individual fibres, disintegration and blending of a relatively tangled mass of fibres, accomplished partly by combing. The tangled mass is usually fed to the machine in the state of a thick continuous layer and finally emerges in the form of a relatively thin web and it is the main object of the carding process to ensure that all the fibres are disentangled and lie substantially alongside each other. It is well-known to make certain roller speeds variable during the running of the machinery. It is also known that an increase of the overall speed of the machine will increase the speed of all rollers leaving the relative speeds of those co-operating with the swift or swifts unchanged. It is also desirable in some cases to decrease the overall speed in order to stop what may be termed stiff types of fibres being flung out by too great a centrifugal force.

In each of the aforesaid cases, when the overall speed of the machine is altered, although the ratio of the relative roller surface speeds will remain unchanged the correspondingly modified speed of each individual roller will very substantially affect its respective function. Consequently after each modification of the overall speed of the machine the individual speeds of rollers, such as workers, doffers, feed rollers, fancies and the like, should be modified in order to create conditions required by other considerations in the carding of a particular blend of fibres.

The main object of the present invention is to control the speed of a particular roller or rollers in order to improve a carding operation.

Accordingly there is provided carding machinery including a train of at least two swifts and co-operating driven worker rollers, characterised in the provision of constant speed drive means for the last swift, and further drive means from said last swift to the preceding swift or train of swifts, which further drive means are of a variable type to allow the speed of the preceding swift or train of swifts to be adjusted independently of said co-operating worker rollers, with the final swift retaining its selected constant speed.

The invention includes carding machinery including a train of five swifts and co-operating worker rollers, means for driving the swifts in successively opposite directions and increasing speeds, said drive means including a constant speed drive to the last swift, a common changeable pulley belt drive to the preceding two swifts from a changeable pulley on the last constant speed swift shaft, a separate belt drive to each of the first two swifts, respectively, from the third and fourth swifts, and variable speed driving means to the worker rollers.

The invention also includes carding machinery wherein worker rollers are mounted in the top and bottom working arcs of at least some of the co-operating swifts, some of said workers being adapted to carry fibres forwardly from one swift to the next swift and the other workers adapted to return fibres from one swift to the preceding swift.

The invention will now be more particularly described with reference to the accompanying diagrammatic drawing in which:

FIG. 1 is a side view showing a train of two swifts with a pair of co-operating worker rollers and a belt drive from the last swift to the first swift;

FIG. 2 is a side view of a train of four swifts with co-operating worker rollers and a variable belt drive to the second and third swifts and a further drive to the first swift; and

FIG. 3 is a side view showing a train of five swifts with a similar belt drive from the last swift.

As shown in FIG. 1 carding machinery includes a simple train of two swifts in carding co-operation, with a first swift **4** rotating anti-clockwise and the last swift **5** rotating clockwise. Worker rollers **6** and **7** are mounted in the lower and upper working arcs of the swifts with worker roller **6** rotating clockwise to pass fibres from swift **4** on to swift **5** and worker roller **7** rotating anti-clockwise to return a percentage of the fibres from swift **5** back on to swift **4**. The worker rollers **6** and **7** may be driven from the same source but preferably are independently driven and their speeds variable. The usual doffing roller **8** is mounted to lift away fibres from swift **5** and a fancy **9** is mounted to co-operate with the swift **5**.

The drive means for the above arrangement comprises a belt drive **10** from an electric motor **11** to a pulley on the shaft **12** of swift **5** to give the latter a selected constant speed of rotation. At the opposite end of shaft **12** is mounted an interchangeable belt pulley **13** from which a belt **14** passes partly round the pulley **15** on the shaft **16** of the first swift **4** then round a large jockey pulley **17**, round an adjustable jockey pulley **18**, which forms the belt tensioner, and round a fixed jockey pulley **19** back to the pulley **13**. This arrangement provides a simple belt drive from a constant speed swift shaft **12** to drive the swift **4** in the required direction and by changing the pulley **13** the speed of rotation of this swift can be varied without alteration of the speed of swift **5**. Preferably pulley **13** is mounted by quick release means to facilitate changing of the pulleys. Also, as shown, an additional worker roller **7***a* with a co-operating stripper roller **7***b* may be associated with the last swift **5**. Alternatively additional such workers and strippers may be provided.

FIG. 2 illustrates a larger train of four swifts with swift **2** much smaller in diameter than swifts **3**, **4** and **5** which may be of equal diameter, e.g., swift **2** may be eight inches in diameter and the other swifts twenty inches in diameter. As shown there are additional worker rollers of which all the rollers **6** feed fibres forwardly from one swift to a succeeding swift and rollers **7** return a percentage of fibres from one swift to a preceding swift. These two worker roller trains are preferably independently driven at variable speeds. In this instance, the driving belt **14**, instead of passing round a large jockey pulley **17**, is mounted on a pulley **20** on the shaft **21** of the second swift **3** and the drive for the first swift **2** is by means of a belt **22** between a pulley on the shaft **23** of swift **4** and a pulley on the shaft of the first swift **2** to give the right anti-clockwise rotation to this swift.

In FIG. 3 the carding machinery includes a train of five swifts with the drive from pulley **13** on the shaft of the last swift **5** arranged similar to that shown in FIG. 2 and the addition of a further belt **24** from a pulley on the shaft **21** of swift **3** to a pulley on the shaft of swift **1** to rotate it clockwise. Here again, worker rollers **6** and **7** are provided in the working arcs of the pairs or swifts, and again the two trains of worker rollers are preferably independently driven at variable speeds.

With the above arrangement the last swift **5** can be driven directly at a selected constant speed and retained thus to be of constant speed relative to the co-operating

doffer and fancy rollers 8 and 9. It will be understood that this speed can be changed if desirable for altering the overall speed of the carding machine.

By use of the simple variable drive from the last swift shaft the other swift speed can be varied, or all the preceding swift speeds can be changed as a train and maintain their predetermined ratio of speeds. It will be understood that the worker rollers can be driven as a train or separate trains from the same driving motor 11 and have a variable speed drive independent of the swift drive so that either train or both can be varied independently of one another with the last swift normally remaining constant with and relative to rollers such as the fancy and doffer. In this manner, the carding power can be varied between given limits by changing the surface speed of rotation of a preceding swift or swifts and changing of the workers' speeds is optional. Moreover, by the arrangement of co-operating worker rollers of which some feed fibres forwardly and others return a percentage of fibres back to a preceding swift, this tends to give a better blending and circulation of the fibres during the carding process.

As shown in FIG. 3 a belt 25 provides the drive between the shaft 12 of the swift 5 and the pulley unit 26 which may be a well known variable speed device. A belt 27 passes from this unit 26 to the shaft of the doffer 8. A further belt 28 from the unit 26 drives the workers 6 and 7 lying in the arcs of the swifts 3, 4 and 5 and a belt 30 from another pulley unit 29, which also may be a well known variable speed device, serves for

driving the workers 6 and 7 lying in the arcs between the swifts 1, 2 and 3. This arrangement provides, in effect, a common drive for the doffer and the workers but it is to be understood that the drive from the swift 5 to the doffer 8 may be independent of the worker drive.

What I claim is:

1. Carding machinery comprising a train of five swifts and co-operating worker rollers, means for driving the swifts in successively opposite directions and increasing speeds, said drive means including a constant speed drive to the last of said swifts, a common variable speed belt drive to the preceding two swifts from a changeable pulley on the shaft of the last constant speed swift, a separate belt drive to each of the first two swifts respectively from the third and fourth swifts, and variable speed driving means for the worker rollers.

2. Carding machinery according to claim 1, wherein the first two swifts are much smaller in diameter than the remaining swifts.

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