This invention relates to means for uniting the web of a replenishing roll to a running web, for use in printing or other machines that unwind a web from a roll of flexible material.

It is apparent that, if the webs are to be united without stopping the machine, it is necessary to bring the replenishing roll from a state of rest up to approximately the speed of the running web and, speaking generally, two methods have been employed in the prior art to bring this about.

One of these methods consists in bringing the replenishing roll into engagement with the running web and driving the roll by frictional contact with said running web, the disadvantage of which will be understood from the following:

The leading end of the web of the replenishing roll is covered with an adhesive by means of which the webs are to be united, and it is therefore necessary to engage the roll with the web directly after the pasted portion on the leading end of the roll has passed by the running web. But as the roll has to be brought up to approximately uniting speed by the time the pasted portion of the roll again comes adjacent the running web it will be understood that said roll has to be accelerated from a state of rest to uniting speed during what practically amounts to three-quarters of a revolution of the roll. It is exceedingly difficult to accomplish this at full speed and it has therefore been found necessary to slow the machine down, but as the object of the so-called "flying paster" is to save time in making roll changes, the disadvantage of slowing down the machine is obvious.

Another method of uniting the webs, as herebefore practiced, is to accelerate the replenishing roll to approximate uniting speed before said roll is brought into engagement with the running web, the acceleration being effected either by belts or aprons engaging the surface of the replenishing roll or by core-driving motors. By this second method the necessary acceleration of the replenishing roll is not restricted to three-quarters of a revolution because, obviously, the replenishing roll can be rotated more than one complete revolution, or as many revolutions as may be desired, before the webs are united, as the roll is not in contact with the running web.

There are, however, disadvantages associated with this second method, the chief of which is the difficulty of coordinating the speed of the replenishing roll with that of the running web.

Rolls of flexible material, such as newsprint paper, vary in diameter and it is therefore necessary to employ rather elaborate and expensive coordinating means to compensate for such variations.

The main object and feature of this invention is to provide a method and means to overcome the difficulties outlined above. I propose to accelerate the replenishing roll by driving it from the running web, thereby assuring speed coordination, and to drive the roll from the running web for more than one revolution of the roll if desired before uniting the webs, thereby affording sufficient time to properly accelerate the roll and thus enabling the roll change to be effected at high speeds.

In the exemplification of the invention herein disclosed this is accomplished by shielding the body of adhesive of the roll during initial rotation of the roll so as to prevent the webs from uniting, and thereafter exposing the body of adhesive so as to unite the webs.

In the accompanying drawings the invention is disclosed in several forms in which:

Fig. 1 is a view partly in side elevation and partly in section of a web replenishing mechanism embodying one form of the invention;

Fig. 2 is a perspective view of a portion of the replenishing roll shown in Fig. 1;

Fig. 3 is a view of the replenishing roll looking in the direction of arrow 3 of Fig. 1;

Fig. 4 is a sectional view substantially on the plane of line 4--4 of Fig. 5 showing a modification of the invention;

Fig. 5 is a view partly in elevation and partly in section of one end of the replenishing roll shown in Fig. 4.

Referring first to the form of the invention shown in Figs. 1 to 3 inclusive, I indicates the conventional rotatable reel carrying, in this instance, three web rolls, the roll 3 being the active roll from which flows web W to the printing or other machine in a manner well understood. 3 indicates the replenishing roll, and 4 is a reserve roll that eventually becomes a replenishing roll and then the active roll. The leading end of the replenishing roll, as is customary, is held against the body of the roll or the adjacent convolution thereof by a suitable bond which may be for instance a body of grease or, as here shown, a number of frangible tabs 5. The leading end of the web of the replenishing roll is further provided with a body of adhesive 6 which may be continuous or interrupted lengthwise of the roll.

Suitable means to shield the body of adhesive is provided, said means forming part of a trans-
mission device to drive the replenishing roll from the running web or from a running belt located in rear of the running web. In the instant form of the invention, the shield consists of a curved member 26 of sheet material that straddles the body of adhesive, and said member 26 may be hollowed out on its inside as at 27 so as not to touch said body of adhesive. Suitable means to hold the shield in position are provided consisting here of frangible tabs 28, 29 indicating a plurality of knives that are normally held in a retracted position by springs 30, and 31 are solenoids that when energized project the knives and sever frangible tabs 28, 32 indicate brackets for guiding the shield out of the machine.

When a roll change is to be effected, the spider is turned to bring the replenishing roll into the position shown in Fig. 1. As the shield is at this time in a position covering adhesive 6, it will be understood that said shield will engage the running web and will at the same time prevent the body of adhesive 6 from engaging said running web and consequently the webs will not be united. The replenishing roll can make as many complete revolutions as may be desired to bring it up to approximate uniting speed and the shield can therefore be brought gradually into engagement with the running web so as to avoid undue shock. When sufficient speed has been attained, solenoids 31 are energized, thereby severing tabs 28 and centrifugal force flings the shield away from the roll, thereby enabling the body of adhesive 6 on the replenishing roll to engage the running web so that the webs are united and temporary bond 5 is released. The old running web can now be severed, and the spider can again be moved to bring the replenishing roll, now the new active roll into the position occupied by roll 2 in Fig. 1. If desired, a reinforcing or backing member in the form of an apron, belts or tapes may be arranged in the rear of the running web at the point where the replenishing roll engages it, and such tapes may be driven by a motor, the speed of which can be coordinated with that of the running web.

In the form of the invention shown in Figs. 4 and 5, the chucks of the replenishing roll carry disks 33 of smaller diameter than the roll of paper. These disks carry brackets or supports 34 adjustable by means of set screws 35 and slots 36. Extending between brackets 34 at opposite ends of the roll is a shield 37 here of frangible material to cover the body of adhesive 15 material on the roll. After the replenishing roll has been brought up to proper speed, solenoids 38 carried by the spider are energized thereby projecting knives 39 and severing the shield. Springs 40 move the knives upwardly when solenoids 38 are deenergized.

I claim:

A web replenishing mechanism, in which a replenishing roll, having a body of adhesive on its leading end, is to be united with a running web, including means to move the replenishing roll toward the running web; shielding means to prevent the body of adhesive from engaging with the running web; elements to hold said shielding means in position to rotate with the roll, and mechanism operable during rotation of the roll to sever the elements that hold the shield in position to thereby admit of removal of the shielding means.

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