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(54) **WEB FOR WEB HANDLING APPARATUS.**

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Description

This invention relates to web handling apparatus of the type comprising a pair of sprocket wheels spaced on opposite sides of the machine and which have a plurality pins of projecting therefrom and equispaced around the periphery of each sprocket wheel for engaging with a line of equispaced holes down each side of the web of material which is to be fed through the machine by the drive to the sprocket wheels. More particularly, this invention relates to a web of material, usually but not necessarily a web of sign making stock, for use with such apparatus having a line of sprocket holes down each side of engagement by the sprocket wheel of the web handling apparatus.

In the loading of such webs into the web handling apparatus, a problem of alignment can arise, particularly with web handling apparatus of considerable width. In these cases it is often quite easy to feed a new web of material into such a machine in a skew position, i.e. with the two sides of the web out of exact alignment, or out of registration by the spacing of one or two pins.

Various designs have been proposed in the past for obtaining the proper initial alignment of the web in the machine by the position of various registration marks or extra registration holes on opposite sides of the web, possibly engaging with extra registration pins on each sprocket wheel, thus ensuring the correct alignment as the web is loaded into the apparatus.

One such proposal has recently been put forth in EP-B-0134064 by Gerber Scientific Products Inc. The solution to the problem proposed by Gerber involves providing each sprocket wheel with an extra registration pin, or possibly two extra registration pins between an adjacent pair or adjacent pairs of drive pins, thus providing a visually distinct group of three or five pins, distinguished from the other pins around the sprocket wheel, by virtue of a different spacing therebetween. Preferably, the extra registration pins are located at the midpoint between two adjacent drive pins, so that the visually distinct group of three (two drive and one registration) pins or five (three drive and two registration) pins is distinguishing by an interpin spacing of $D/2$ where D is the normal pin spacing, i.e. the normal spacing of all drive pins around the periphery of the sprocket wheel.

Correspondingly, the web for use in the Gerber apparatus has at intervals along the length of the web equal to the circumference of the sprocket wheels an extra registration hole, or as the case may be, two extra registration holes, on the same line as the line sprocket drive holes down each side of the web, and located between an adjacent pair, or two immediately adjacent pairs of drive

holes, and again preferably at a spacing of $D/2$. The web thus has, down each side, at the appropriate intervals corresponding to the circumference of the sprocket wheels, a visually distinct group of three or five holes aligned with each other across the width of the web. Because of the different pin/hole spacing, it is impossible for the loader to load the web into the web handling apparatus in anything other than the correct registration, since this is the only position in which the web will fit onto the sprocket wheels, i.e. with the extra registration pin(s) engaging the extra registration holes on the opposite sides of the sheet.

At various times in the past, webs having differently configured sprocket pin drive holes have been proposed, including extra holes in the web, either in line with the sprocket pin drive holes or to one side thereof (US-A-4802692), and for a variety of different purposes, but mainly to accommodate misaligned pins on the drive sprockets. For example, it is known from DE-A-1964643 to provide either enlarged holes of elongate, round ended elongate slots between each adjacent pair of drive holes (see in particular Fig. 3). Also, in EP-A-382574 (published 16.08.90), a web is shown having additional in-line sprocket holes at half pitch spacing between the normal drive holes, those additional sprocket holes being associated with radially extending cuts or lines of weakness, which enable the web to deform and be deflected if the web should encounter a misaligned drive pin. Webs having that type of hole configuration, i.e. with extra in-line holes at half pitch, will, of course, be useable on apparatus of the Gerber type, i.e. with the extra in-line registration pin on each sprocket drive, but were not specifically designed to do so. In contrast, the present invention seeks to provide a web configuration which will fit equally well onto the apparatus of the Gerber type, i.e. having an extra registration pin, or possibly two, on each sprocket wheel, in line with and spaced between an adjacent pair, or between two immediately adjacent pairs, preferably at a spacing $D/2$, although that is quite immaterial as far as the present invention is concerned, or on apparatus with the more usual form of sprocket drive.

The web configuration of this invention is shown in the accompanying drawing, which is a plan view of a web (1), e.g. a web sign making stock, although the material from which the web is constructed is wholly immaterial to the present invention, of indefinite width, i.e. whatever width is appropriate to fit a particular apparatus, and indefinite length, and having a line of equispaced sprocket drive pin holes (2,2') down each side and spaced inwardly in distance "d" from the edge of the web. Again the value of "d" is immaterial and will depend on the intersprocket spacing of the

apparatus concerned and the overall width of the web. Usually, "d" will be of the order of 1-2 cms.

On the same line as each line of sprocket pin holes (2,2'), and down each side of the web, are elongated slots (3,3') equispaced between each adjacent pair of sprocket pin holes (2,2') having a length "l" (see the enlargement) that is equal to or less than $D-2r$, where D is the interhole spacing and "r" is the radius of the sprocket pin holes, and a width "2r", i.e. a width that is equal to the diameter of the sprocket drive holes.

When considered along the length of the web, the opposite ends of each slot (3,3') are inwardly arcuate at a radius r' that is preferably equal to r. Thus each of the slots (3,3') is separated from its adjacent sprocket pin holes (2,2') by an arcuate web of material (4,4') having a uniform width "w", measured in the longitudinal direction of the web that is equal to at least 2mm, thereby to give the web adequate longitudinal strength.

As will be apparent, such a web will fit apparatus of the Gerber type incorporating an extra registration pin or pins on the sprockets in line with and between adjacent sprocket pins.

When loaded with a web according to the present invention, the elongated slots (3,3') will permit the web to be driven quite smoothly through the apparatus in the normal, conventional manner, i.e. by the equispaced drive pins on each sprocket engaging the drive holes (2,2') on the web. The elongated slots (3,3') are simply there to permit the web to run over the extra registration pins(s) on each sprocket wheel, but serve no other purpose. In particular they do not serve the purpose nor the function of the extra registration holes as taught by the Gerber patent, since the slots (3,3') are incapable of distinguishing adjacent pairs of sprocket holes anywhere along the length of the web. The slots (3,3') therefore do not serve any registration purpose or function.

If desired, a registration function can be provided in known manner, by providing an indicator mark at equal intervals along each edge of the web adjacent opposite pairs of drive holes (2,2'). Such an indicator is shown at (5,5') comprising an extra hole at intervals along each edge of the web at a longitudinal spacing equal to the circumference of the sprockets, and at a distance d' from the edge of the web where d' is greater (or less) than d by an amount greater than $r + r'$, where r' is the radius of the indicator hole. Preferably d' is greater than $d + r + r'$, i.e. the lines of the indicator holes (5,5') are preferably inset relative to the lines of the sprocket drive holes (2,2'). As will be apparent, the indicator or registration holes (5,5'), or other indicator or registration marks, such as a line or arrow printed at intervals along the length of the web, will be at an intermark spacing of xD , where x is an

integer greater than 1 and D is the interhole spacing, corresponding of course to the interpin spacing on the sprocket drive wheels. Preferably of course the intermark spacing will be equal to nxD , where x or D are as defined and n is the number of drive pins on each sprocket, or in other words, the intermark spacing is equal to the circumference of the sprocket wheels.

Claims

1. A web (1) of sign making stock of indefinite length for use with web handling apparatus of the kind comprising a pair of spaced apart sprocket drive wheels, said web having lines of equispaced sprocket drive pin drive holes (2, 2') along the length of the web inset from the opposite edges of the web for engagement with the sprocket pins of the sprocket drives of the web handling apparatus, and between each and every sprocket pin drive hole (2, 2') down each edge of the web, an elongated slot (3, 3') having a width, in the transverse direction of the web, substantially equal to $2r$, where r is the radius of the drive holes, and a length, in the longitudinal direction of the web, which is less than $D-2r$ where D is the interhole spacing and r is as above defined, wherein the opposite ends of each slot (3, 3'), in the longitudinal direction of the web are inwardly arcuate at a radius r' where $r' = r$, thus leaving between each slot (3, 3') and each drive hole (2, 2') an uninterrupted arcuate web (4, 4') of material having a uniform width (w), in the longitudinal direction of the web, of at least 2mm.
2. A web according to claim 1 wherein, at regular intervals along the length of the web (1), and aligned on opposite sides thereof immediately adjacent one of the drive holes (2, 2') in each line of drive holes, there are provided registration indicator marks (5, 5') at an intermark spacing along the length of the web, of xD , where x is a whole number greater than 1, and D is the interhole spacing.
3. A web according to claim 2, wherein the indicator marks take the form of extra registration holes (5, 5') at intervals along the length of the web (1) equal to xD and located on a line inset from each edge of the web by a distance greater than the spacing of the drive holes (2, 2') from the edge of the web.

Patentansprüche

1. Bahn (1) eines zeichenerzeugenden Materials unbestimmter Länge für die Verwendung mit

einer Bahnhandhabungsvorrichtung der Art, die ein Paar im Abstand voneinander angeordneter Antriebszahnäder hat, wobei die Bahn Reihen von im gleichen Abstand angeordneten Zahnradantriebsstift-Antriebslöchern (2, 2') entlang der Länge der Bahn von den einander gegenüberliegenden Kanten der Bahn nach innen gesetzt für einen Eingriff mit den Zahnradstiften der Zahnradantriebe der Bahnhandungsvorrichtung hat, und zwischen jedem Zahnradstiftantriebsloch (2, 2') abwärts jeder Kante der Bahn einen länglichen Schlitz (3, 3') mit einer Breite in der Querrichtung der Bahn im wesentlichen gleich $2r$, wobei r der Radius der Antriebslöcher ist, und mit einer Länge in der Längsrichtung der Bahn, die geringer als $D - 2r$ ist, worin D der Abstand zwischen den Löchern und r wie oben definiert ist, umfaßt, worin die entgegengesetzten Enden jedes Schlitzes (3, 3') in der Längsrichtung der Bahn mit einem Radius r^1 nach innen gekrümmt sind, wobei $r^1 = r$, so daß zwischen jedem Schlitz (3, 3') und jedem Antriebsloch (2, 2') ein ununterbrochenes bogenförmiges Bahnstück (4, 4') von Material mit einer gleichmäßigen Breite (w) in der Längsrichtung der Bahn von wenigstens 2 mm bleibt.

2. Bahn nach Anspruch 1, bei der in regelmäßigen Abständen entlang der Länge der Bahn (1) und auf entgegengesetzten Seiten derselben ausgerichtet, unmittelbar zu einem der Antriebslöcher (2, 2') in jeder Antriebslöcherreihe benachbart Markierungen (5, 5'), die die Lagegenauigkeit angeben, in einem Abstand zwischen den Markierungen entlang der Länge der Bahn von xD vorgesehen sind, worin x eine ganze Zahl größer als 1 ist und D der Abstand zwischen den Löchern ist.

3. Bahn nach Anspruch 2, bei der die Anzeigemarkierungen die Form von gesonderten Lagegenauigkeitslöchern (5, 5') in Abständen entlang der Länge der Bahn (1) gleich xD und auf einer Linie haben, die von jeder Kante der Bahn um einen Abstand größer als der Abstand der Antriebslöcher (2, 2') von der Kante der Bahn nach innen gesetzt ist.

Revendications

1. Bande (1) de matériau de signalisation de longueur indéfinie pour utilisation avec un appareil de manutention de bandes du type comprenant une paire de roues d'entraînement à picots espacées, ladite bande comportant des lignes de perforations d'entraînement de picots de roues (2, 2') le long de la bande vers

l'intérieur des bords opposés de la bande pour engagement avec les picots de roues des entraînements à roues de l'appareil de manutention de bandes, et entre chaque perforation d'entraînement de picot de roue (2, 2') dans chaque bord de la bande, une fente allongée (3, 3') ayant une largeur, dans la direction transversale de la bande, sensiblement égale à $2r$, où r est le rayon des perforations d'entraînement, et une longueur, dans la direction longitudinale de la bande, qui est inférieure à $D - 2r$ où D est l'espacement entre les perforations et r est comme défini ci-dessus, dans laquelle les extrémités opposées de chaque fente (3, 3'), dans la direction longitudinale de la bande, sont arquées vers l'intérieur à un rayon r^1 où $r^1 = r$, ce qui laisse entre chaque fente (3, 3') et chaque perforation d'entraînement (2, 2') une bande arquée ininterrompue (4, 4') de matériau ayant une largeur uniforme (w), dans la direction longitudinale de la bande, d'au moins 2mm.

2. Bande selon la revendication 1, dans laquelle, à intervalles réguliers le long de la bande (1), et alignés sur les côtés opposés de celle-ci immédiatement adjacents à une des perforations d'entraînement (2, 2') dans chaque ligne de perforations d'entraînement, sont prévus des repères (5, 5') à un espacement entre repères le long de la bande, de xD , où x est un nombre entier supérieur à 1, et D est l'espacement entre perforations.

3. Bande selon la revendication 2, dans laquelle les repères se présentent sous la forme de perforations de repère supplémentaires (5, 5') à intervalles le long de la bande (1) égaux à xD et situées sur une ligne espacée vers l'intérieur de chaque bord de la bande d'une distance supérieure à l'espacement des perforations d'entraînement (2, 2') du bord de la bande.

