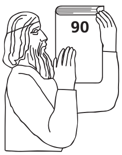
Механізм підмотування	Датчик матеріалу	Регулювання подачі	Кількість двигунів	Вид привода
SZQ-JX-K64	+	+	1	муфта
Dix-Fed sys	+	–	1	муфта
D74	+	–	2	муфта
П-720	+	+	1	зубчастий
SZQ-JX-K74	+	+	1	муфта
SZQ-JX-T3	+	+	1	муфа
Проектований	–	+	1	фрикційний

Порівняння механізмів підмотування



відмінності у способі кріплення, зручності експлуатації, кількості двигунів та саме головне — у способі намотування матеріалу. Спроєктоване рішення (останній рядок таблиці) відноситься до механізмів підмотування з провисанням матеріалу, надаючи ріжучій машині достатньої свободи руху, якої не можливо досягти в інших механізмах. Це дає змогу мінімізувати механічні пошкодження, унеможливлює деформування матеріалу в процесі висікання, підвищує надійність та здешевлює проєкт.

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DEVICE FOR CUTTING MULTIPROFILE HOLES IN CARDBOARD SCANS

This article discusses devices for cutting multiprofile holes in cardboard scans. The general principle of operation

of crucible die-cutting mechanisms is given, its shortcomings are analyzed. Also a device for cutting multiprofile holes with a pneumatic module instead of metal cheek is described.

Keywords: die-cutting; crucible devices; pneumatic module; multiprofile holes.

У цій статті розглядаються пристрої для висікання різнопрофільних отворів у картоні. Наведено загальний принцип роботи тигельних висікальних механізмів, проаналізовано його недоліки. Також описано пристрій для висікання різнопрофільних отворів із пневматичним модулем замість металевого марзану.

Ключові слова: висікання; тигельні пристрої; пневматичний модуль; різнопрофільні отвори.

In the printing industry there is a crucible mechanism for cutting cardboard scans. It is based on a fixed lower plate and a movable upper pressure plate with punching elements. The design of the mechanism for lifting the movable plate consists of four hinged and crank-slider contours, as well as the existing design consisting of lever wedge and eccentric mechanisms that allow the pressure plate to move vertically.

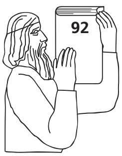
Devices of this type have disadvantages: the difficulty of ensuring steady pressure over the entire plane of the moving plate, and as a result the difficulty of obtaining quality products. Also, this mechanism requires high energy consumption, as the movable plate is metal and solid. In addition, the mechanisms designed for lifting the movable plate also have disadvantages, such as the presence of unstable movement of the pressure plate. This movement has a negative impact on the quality of products, as well as productivity of the device.

There is also an advanced device that eliminates the swinging motion of the moving plate. The drive of such a device consists of left and right sliders. They are moved by eccentrics along the guides, which are hinged to the connecting rod and rocker arm. Despite this, there are the following disadvantages: the use of sliders in the mechanism causes additional energy consumption and the formation of gaps in the mechanism. This has a negative effect on the accuracy of the rolling plate positioning.

The proposed device for cutting various contours in cardboard consists of a clamping plate on which various cutting elements for cardboard processing are mounted. The actuators include guides and crank drive. A two-chamber pneumatic module with contour grooves in the working area is used as a counterweight.

The device works on the following principle: the cardboard scan is transported to the area of cutting contours by a cog belt conveyor. Reversible movements of the pressure plate and movement to the cardboard scan, which is fixed on the desktop, are due to the cyclic rotational movement of the crank, connecting rod and guides. The pressure plate contains elements for processing cardboard and ejector pillows.

Supporting compressed air is formed in the two-chamber pneumatic module. In this case, the rod moves the piston, which displaces compressed air from the lower air chamber. The air moves through the perforated contour grooves, equidistant from the center of the piston in the walls of the intermediate chamber to the upper pneumatic chamber and the desktop with forming contour grooves.



The cardboard is cut in the process of lowering the pressure plate. Due to the fact that there are ejector pillows, the cardboard blank is additionally fixed with them on the desktop. Prepared compressed air in a steady plane creates resistance to the cutting force of cutting tools. This provides a high-quality technological process of processing cardboard scans.

Simultaneously with the idling of the pressure plate, the cardboard scan is moved by cog belt conveyors to the next zone, and the compression spring in the two-chamber pneumatic module returns the piston to its original position.

This device is much more promising than devices that have a metal plate as opposed to a knife, because in this case there is no contact with the support plane and, as a result, the cutting knives do not become blunt and do not run out the base plate itself. In addition, using a device with a pneumatic module, makes the cutting process less energy taking and resource consuming. There is no negative impact on the environment when using a pneumatic module, as it works on the basis of compressed and rarefied air.