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GENERAL ASPECTS OF FASHION DETAILS TEXTILE PROCESSING

An important task of mechanical engineering is to improve production. To do this, it is necessary to improve the production technology, by introducing advanced methods for obtaining billets, improving their mechanical processing. It is also necessary to remember the reduction of production costs and productivity. Implementation of unmanned, non-waste and energy-saving technologies, saving of raw materials and energy resources, improvement of equipment will increase the durability of products and the flawless perfomance.

Thus, in order to succeed in the market nowadays, an industrial enterprise is forced to work on shortening the production period, reducing its cost and quality. The rapid development of computer and information technology has led to the emergence of CAD / CAM systems, which are the most productive tools for solving these problems.

CAD-systems (computer-aided design) is implied by the software that automates the work of the design engineer and allows to solve the constructing tasks of products and the processing of technical documentation using a personal computer.

CAM systems (computer-aided manufacturing) automate calculations of the tool moving trajectories for machining on CNC machines and provide the issuance of control programs managed by a computer.

Most of the parts in the machine building, needed for the production of machines, are processed on metal-working machines. The effectiveness of their manufacturing is determined by the efficiency of obtaining parts of the given shape, size and surface quality on the existing machine tools at the company with the minimum possible time, energy and money costs.

The effectiveness of lathe turning depends on many factors, in particular, on the perturbations that are effective in turning the workpiece. These perturbations can be conventionally divided into fast-moving (the constancy of the cutting process, the precision of forming in the cross section of the part, the uneven hardness of the material of the workpiece) and the slow-moving (gradual dimensional dipletion of tools, the change in the accuracy of molding in the longitudinal direction of the part), wherein the significant impact on the output properties of the processing (precision and roughness) has the fast-moving. The main ones are the changes in the size of the dropping force, the hardness of the finished workpiece and the state of the tool.

As you can see, the effects of the perturbations change the values of the performance of the processing. One of the possible ways to increase efficiency is the management that is carried out in processing the speeds of machine working lathes, as well as the development of cutting process control systems that increase the efficiency of machining on lathes both with numerical control (CNC) and without it.

Consequently, the machine-building industry needs to improve the details processing on lathes. However, this is constrained by the lack of appropriate management methods and principles for building control systems for working machines. And this gives grounds to state that the study of this issue is an actual scientific and applied problem, the solution of which will contribute to increase productivity, to reduce the cost and energy losses when turning, in particular, shaped parts on metal-working machines and to increase the competitiveness of products of the machine-building industry.

Turning lathes are mostly used to handle the bodies of rotation. When performing operations on these machines, obtaining external and internal cylindrical and conical surfaces, shaped surfaces, end planes, etc is provided.

Shaped surfaces of parts (both external and internal) formed by a curvilinear creator, a combination of rectilinear creations, located at different angles to the axis of the part, or a combination of curvilinear and rectilinear creations, are treated with special shaped cutters with cross-sectional feeding of the support.

Let's study the existing methods of formation of shaped surfaces on lathes more detailed, namely, using manual transverse and longitudinal feed of the cutter relative to the workpiece with the fitting of the profile of the treated surface on the pattern; machined shaped cutters, profile of which corresponds to the profile of the finished part; using a transverse and longitudinal feed of the cutter relative to the workpiece, as well as a device and a copier device, allowing to process the surfaces of a given profile; by combining the above methods to improve the accuracy and processing performance.

The main tool for working on a lathe-screw machine is a lathe cutter. There are a large number of them, there are individual incisors for sharpening, trimming, cutting off conical and cylindrical surfaces, and also cutting tools with which you can cut both the external and the inside through. They can move longitudinally, across and at an angle to the axis of rotation of the part. The combination of such movements of the details and the cutting tool - the cutter allows to receive various surfaces of the cut such as cylindrical, tapered, shaped, screw etc.

Shaped cutters are chisels in which the cutting edge coincides with the curvilinear or stepped profile of the treated surface. Based upon our study, we will examine in more detail the types of shaped incisors and their purposes.

Shaped cutter for processing concave surfaces. The advantage of such incisors is the simplicity and relatively low cost of manufacturing. Their significant disadvantage is that after several, and sometimes two or three, reorientations on the front surface (and for preservation of the profile, they can be redeployed only on the front surface) plate is wasted, the height on the center during the installation decreases and the cutter becomes unfit for further work. Therefore, rod shaped cutters are used mainly in cases where the work is not massive and the profile of chisels is simple.

Prismatic shaped cutter. The front surface is the face of the bar, from which the cutter is made, and the rear corner is formed due to the sloping position of the cutter in the punch. For fastening in a punch the prismatic cutter along the entire length (from the back side) has a projection in the form of a swallowtail, which is a part of the same groove punch. The punch is knotted, so when tightening the screw, it is compressed and the cutter holds it firmly. Lack of cutter - the complexity of manufacturing.

Disc shaped cutter. The front surface of the disk cutter is located below its axis by a value h, which creates the required rear angle. If this decrease is equal to 1/10 of the diameter of the cutter, its rear angle is about 12 °. The front angle of the shaped incisors in most cases is 0 °. Under this condition it is simplified to manufacture a cutter; in addition, the cutter is not tightened into a piece and the surface is processed of high quality. The width of the shaped cutters does not exceed 40 mm, but sometimes the shaped cutters are used up to 100 mm in width.

To get the correct profile of the treated surface, the shaper cutter must be installed so that its cutting edge is exactly at the height of the center of the machine. The position of the shaped cutter, if you look at it from above, should be checked with a small corner.

When fastening shaped incisors it is necessary to observe carefully the general rules of incisors fastening.

The feed of a shaped cutter in most cases is done manually. It should be uniform and not to exceed 0.05 mm / s for the width of the cutter 10-20 mm and 0,03 mm / s for a width of more than 20 mm. It should be noted that the feed should be less than the smaller diameter of the workpiece. When machining the part of the piece, located closely to the patron (or to the backbone), the feed can be taken more than when processing a site located relatively far from the patron (or from the backbone).

The mechanical processing of shaped surfaces with the simultaneous action of the longitudinal and transverse manual feeds of the cutter is carried out with a small amount of machined parts or with relatively large sizes of shaped surfaces. In the first case, even the manufacture of a regular shaped cutter is inappropriate, in the second case, it would be necessary to have a very wide cutter, the perfomance of which would inevitably cause the vibration of parts.

Removal of the abseil is carried out with a needle-nose finishing or passable cutter. To do this, you need to move (manually) longitudinal guides to the left and simultaneously the transverse guides of the carriage forward and backward. When processing relatively small shaped surfaces, the longitudinal feed is carried out using the upper guides of the support, mounted so that their guides are parallel to the center line of the machine; For transverse feeding the transverse guides of the support are used. In all cases, the vertex of the cutter will move along the curve. After several passes of the cutter and at the correct ratio of feed quantities (longitudinal and transverse), the treated surface receives the required shape. This operation requires skills. Experienced lathers, processing shaped surfaces in this way, use an automatic longitudinal feed, manually moving the transverse caliper simultaneously.

It should also be noted that the shaped cutters operate in difficult conditions, since they cut a wide chip. Therefore, the transverse feed for them should be selected in an understated range of 0,02-0,08 mm / o depending on the stiffness of the part. Due to the small depths of the shaped profile, the feeding of the cutter is usually done manually. To clean the treated surface at the end of the working stroke of the cutter it is recommended to make a slight stamina, and then remove it from the part.

Summarizing the foregoing, in order to obtain the turning processing of the shaped part of the given accuracy, it is necessary, ultimately, to provide a stable relative shaping movement of the workpiece and the tool using the CAD / CAM system.