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RESEARCH OF DETERIORATION AND PRODUCTIVITY OF A BAND SAW

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In the given work specific characteristics of deterioration of band saws are considered that allow to predict sawing up process and raise firmness of the tool and its productivity.

Deterioration of teeth of a band saw on a back surface was measured in process of experimental sawing up material in diameter by 160 mm, which was steel 45. We applied the band saw machine model C8523 Joint-Stock Company "special design bureau ALMS" As a tool was used bimetallic band saws of firm "Rongen" in height of 27 mm with variable step of teeth at length of 25,4 mm As applied 10 % of a solution emulsion.

The band saw has many teeth which of them cut only small part in time of cutting. Sawing up by a band saw is one of the most effective ways of cutting considering distribution of heat and effort of cutting.

Deterioration of teeth of a band saw is typical to the mechanism of deterioration of other cutting tools. And still deterioration occurs in unusual way. Teeth wear out in the localized zones - on a back of a tooth and on its lateral surfaces where the tooth contacts to a processed material. At definition of firmness intensity of deterioration of a band saw is the most convenient for defining at measurement of deterioration of teeth on a back surface. Deterioration can be divided into three zones: a zone extra earnings, an operating conditions and a zone of critical deterioration during which time it is necessary to replace a saw.

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RATIONALIZATION OF SECONDARY POWER SUPPLY

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Single phase secondary power supply (SPS), thanks to small weight/torque ratio (kg/kW) and quick response time, has found widespread use in a range of capability from tens W (home video) to several kW (electrical constant-voltage regulator, electric arc welding sets and so on).

One of the essential disadvantages of SPS is low power factor (PF). By using a power factor corrector of modified algorithm of operating it, which allows PF up to 0, 95 and more [1], this issue can be considered solved. The following rationalization of SPS in terms of, for example weight/torque ratio decrease and wastage decrease has the following restrictions:

- because of asymmetry of output strain of a chopper power isolation transformer is fulfilled with an airspace in the core and is used only at a private loop, that makes ineffective two- cycle bridge scheme of a chopper in comparison to single- cycle, and eventually leads to transformer overall factors increase.
- increase of output strain frequency of a chopper allows to decrease size of a transformer and smoothing inductor. However, wastage in power transistor is increased. The last is especially essential for powerful SPS.

Including capacitors successively in a chain of power transistor primary coil allows excluding constant constituent in output strain of a chopper and in some cases decreases commutation wastage in power transistors.

Using semi-bridge transistor choppers with capacitors in a power chain for SPS provides two-cycle mode of transformers while there's no constant constituent in a stress curve. This allows using a core without airspace and with high extent of rectangularity of a loop. As a result transformer's size and wastage in it may be decreased (with the same frequency) in 2-4 times in comparison to schemes without capacitors. The advantage of this solution is also simplicity of a chopper power part (two-cycle mode is achieved only by two power transistors). Correspondingly, operating system is simplified.

A bridge scheme, as well as semi-bridge, allows two-cycle mode of a power transformer and its whole usage. There are twice more power transistors and output channels of chopper operating system in this scheme, but there's only one commutating capacitor.

The two considered SPS schemes with capacitors in power chain are identical by its external characteristics, however bridge scheme (except for low power SPS) is more preferable than semi-bridge.

Including capacitors into chain of primary coil of chopper power transformer gives an opportunity to use the core of the transformer without airspace and with little excitation current and with the use of the whole loop that allows essentially decreasing its size. Natural external characteristic of capacitor choppers has lineal part with rigidity determined by total resistance of SPS and a section with load constant power. The lineal part may be, for example, used for welding in carbon dioxide, and section with constant power is ideal for welding in the air. Moreover, capacitor's real doubling of rectified voltage amplitude simplifies