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INCREASING THE PRODUCTS QUALITY USING PROGRESSIVE KNOWLEDGE IN THE FIELD OF CONSTRUCTION

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ABSTRACT

The increasing of machine quality requires constructor to use the progressive knowledge to design as well as observing the instructions, regulations, directives and standards.

The producer, ISO 9001 Certificate owner is the only one who is possible to achieve the high quality of machine or the producer, who meets criteria following the ISO 9001 standard, that means quality system, model of quality provision in designing and development processing, plant implementation and service. More and more, up-to-date knowledge gains ground: using 2D CAD but mostly 3D CAD systems will guarantee the high quality of the products.

Key words*: construction, designing, quality, Combinator*

1. APPLICATION OF UP-TO-DATE KNOWLEDGE IN THE DESIGNING

It is very important to consider the following designing knowledge and up-to-date directives which guarantee a high quality of machine:

- construction simplicity of the machine with modulation solution
- utilizing standardized spares and components
- applicable exchangeability with using standardized joints the increasing of component sensitivity to ensure the mechanical and electrical precaution in order to overtake failures and losses cased by people
- using autonomous tools in order to automatic configuration

The EN 292 standard specifies technical rules and statements. These can help constructor to project and design the machine as well as to guarantee machines´ safety for the professional and amateurish use. Existing computational programming utilization for example COSMOS, STATOGRAPHICS software etc. to calculate the machine and its components.

Utilization of 2D CAD systems for drawings, spares plans, sub-assembly plans and strut frame drawings in order to increase design quality proceeding and increasing product quality effect.

Likewise, using 3D CAD technologies which make it possible for parametric designing and objected oriented designing is needed. The increasing of machine quality requires

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The Quality Management System Model consists of research and development activities through production, production control and control testing to assembly service for consumer. These procedures make total completion system in compliance with ISO 9001 Standard. The ISO 9001 Standard is divided into 20 parts (chapters) which specify and define demands to designing. The most important for constructors are following:

- *Implication* – to document all proceeding including product planning, producing, designing and products´ testing as well as continuous proceeds´ control of research's aims. The product transfer system of research and development has to be defined.
- *Product Identifyability and Cohesion* – to insure the identifyability of semi-products and products in production cycle must be done.
- *Production Process Management* – the producer has to imply production procedure which directly influencing quality and he has to ensure to make this process in ordinary mode.
- *Control and Control Testing Process* – to document the fulfillment of demands stated in advance trough input, in-operating and output control using technical control and control testing process.
- *Preparation* – to systematically determine the importance of employee's preparation and to guarantee the preparation all of employee's influencing the quality.
- *Service* – documentation for consumers' services defines demand investigation procedure of service, planning, way of service and cooperation with other bodies.

2. DESIGNING AND IMPLEMENTATION OF THE COMBINATOR - COMBINED PLOUGH SYSTEM

Implementation of knowledge in the field of designing
Agro-technical demands of the Combinator:
The tilled soil demands:

- soil loosening depth max. 0,2 m
- underfoot and planed soil using framed or spike-tooth roller
- width of planed area: 3 m

- max. speed 7 km/h

Calculation of basic parameters

PC software as CAD system is used to count and verify the basic technical parameters in the designing operations.

Basic parameters:

Length	1330 mm	Power effect	60 kW
Width	3350 mm	Power consumption	31 kW
Altitude	1276 mm	Capacity:	2 $ha.h^{-1}$
Input speed	540 min^{-1}	Volume when tooth-roller used:	1372 kg
Rotor Speed	270 min^{-1}	Volume when framed roller used:	1222 kg
Number of rotors	12		

Construction

The drawings of the Combinator (strut frame, sub-assembly and drawings) were made on PC using graphic software AutoCAD R13 version C2. Part of designing operation is shown in the Fig. 1 and Fig.2.

Function

The Combinator is determined to soil cultivation. It consists of rotate harrows and roller. The Combinator is connected to power supply trough supple-point connector. The front-wheel drive of rotate harrows is carried out of output shaft tractor trough connecting shaft into primary gear box. In the configuration is possible to change the roller. For heavy textured soil we propose tooth-roller and for light textured soil propose framed roller.

Operating conditions of Combinator:

The Combinator is operated by one worker. He manipulates tractor and location of 3-point hinge trough hydraulic system. The Combinator can be transported as a compact or part by part (that mean, separately rotate harrow and roller) to the placement - to the field. Rotate harrows are functioned right in the placement – in the field, after lowering to required depth. At the end of line the worker moves the Combinator to the transport mode which means: after the hydraulic system is lifted, the Combinator turns in next line and activates to working mode to continue.

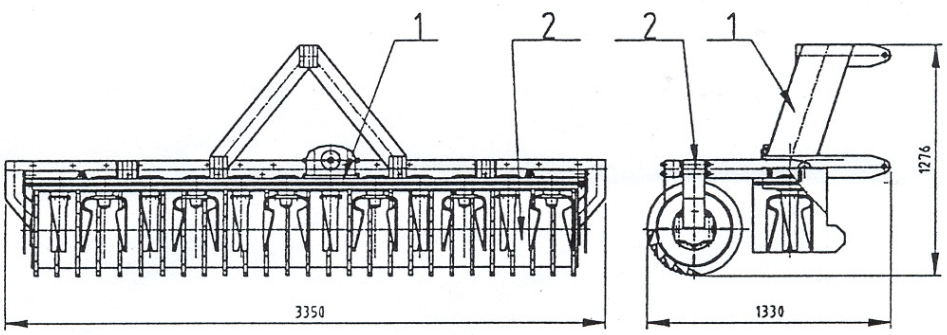

Fig. 1 View of configuration of soil tillage device
1 – rotate cultivator, 2 – tooth or framed roller

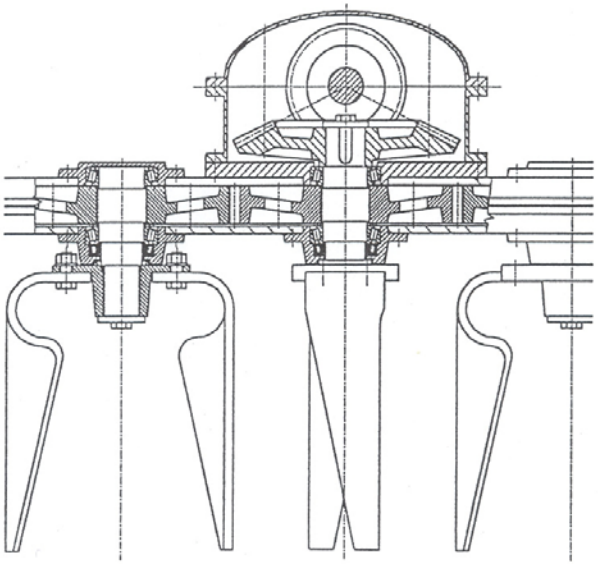

Fig. 2 The skiagraphy of roller tillage and gear-box.

SUMMARY

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