

*Ukraine. Implementation methods Predlozheny ymeyuschehosya potentsiala mebelnoy and woodworking industry.*

**-Power, furniture, timber out production, exports, imports, activities of, potential.**

*An analysis of technical and economical facilities for production of furniture and wood products from Ukraine. Analyzed effect of export-import operations on state of domestic market of Ukraine. Proposed methods of existing potential of woodworking and furniture industry.*

**Power, furniture, wood products, exports, imports, activities, potential.**

UDC 674.05

## **NEW EFFICIENT EQUIPMENT FOR PROCESSING Wooden pallets**

**ZS Lassie, Ph.D.**

*Studied precision cutting wooden pallets on specially created automated line.*

**Wood pallets, pallet processing line, precision and quality.**

Today transportation of products, of handling and its storage spend mostly using wooden pallets. The quality of work depends on the precision manufacturing pallets and their processing (marking, cut corners and lower milling boards).

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Choosing the right pallet will effectively carry products perform loading and unloading operations and store to store.

**The purpose of research.** The aim is to improve the accuracy of cutting corners pallets and milling of the lower boards.

**Materials and methods research.** According to GOST 9557-87 "Poddon Flat Wooden Size 800 × 1200 mm. Tehnycheskye terms "[1], which are international standards for the manufacture of timber pallets used wood (fir, spruce, pine, larch) and hardwood timber (alder, birch, poplar, oak, ash, beech, elm, acacia, maple, sycamore, chestnut). The design of the pallet must comply with HOST9078-84 "Poddony ploskye. General specifications "[2] and be designed to withstand without residual strain workloads maximum permissible load in the storage, transportation and transshipment.

Wooden pallets details must be without blemish: acute obzelu, germinate, rot, mechanical damage and foreign matter. Knots to 10mm

diameter are excluded. The diameter of a bitch should not exceed  $\frac{1}{4}$  of the width of the board in cross boards and  $\frac{1}{3}$  the width of the board - on other boards.

Tray made of longitudinal planking boards connection with cross boards, following connection of the upper deck longitudinal and transversal boards and boards of foundations checkers. Longitudinal board flooring planks connect with transverse screw nails chotyrohodovymy 3.5 mm and length of 60 mm. Checkers should be made from a piece of wood or a piece of wood waste presmasy GOST 11368-89 [3]. Option surface roughness tray - GOST 9078-84.

Test trays made on the automated line modes. «MFRA-1000" company «IV Hart AB» (Sweden) and on the automated line, which was created with the author of the article (patent number 62908) [4] conducted in LLC "Italinvestif." Established line different from the line fashion. «MFRA-1000" that guides the system of regulation width and length pallets made of thick polished round tubes adjustable in length by moving them parallel to the longitudinal axis of the pallet labeling machine heads for marking pallets and dusty calipers on the machine to cut corners and pallets the width of moving calipers using adjusting screws on all machines line and clamp system made of six individual actuators, each of which is equipped with clamping roller.

The general view is an automated processing line for wooden pallets shown in Fig. 1.

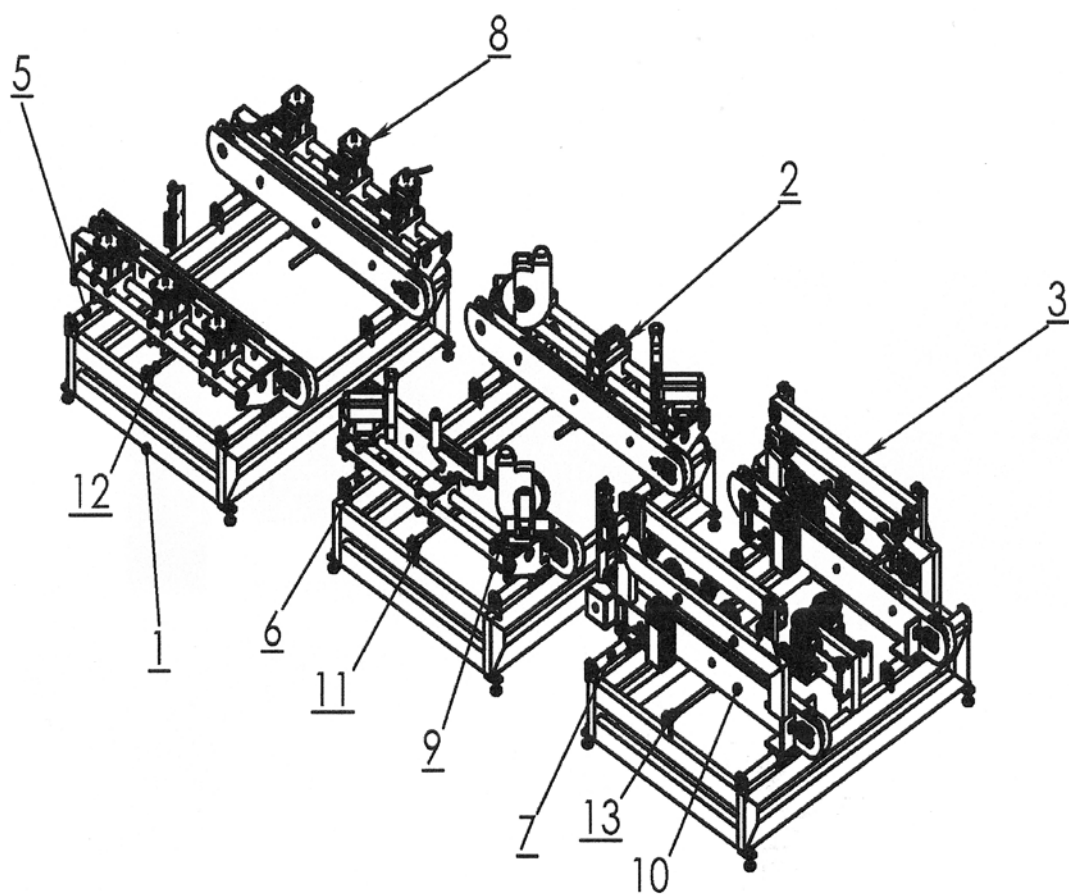


Fig. 1. General view of automatic processing line for wooden pallets: 1 - marking machine pallets; 2 - machine to cut corners pallets; 3 - machine for milling Lisok lower pallet boards; 5, 6, 7 - directing regulatory system pallet width and length; 8, 9, 10 - the system moving circular saw and milling calipers; 11 12 13 - adjusting screws; 14 - pneumatic cylinders.

Precision trimming corners of the pallet was determined by measuring the angle  $\alpha$  using a vernier goniometer with GOST 5378 [5] (Fig. 2).

Perpendicular milled Lisok lower pallet boards with respect to their longitudinal edges were determined using a verification gon GOST 3749 [6] and the probe by TU 3936-214-54769955-2008 [7]. Place in measuring the angle shown in Figure 2 (section A-A).

**Results.** The results of measurement of the angle  $\alpha$  Pallet circumcission angles on the automated line modes. «MFRA-1000" and on established lines are shown in Table. 1.

**1. The results of measurement of the angle  $\alpha$  circumcission angles pallets.**

Number (refer to sample)	The value of the angle $\alpha$ on line «MFRA-1000», °	The value of the angle $\alpha$ created on line, °
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1	137	136
2	138	135
3	137	136
4	136	136
5	138	134
x = 137.2 August		x = 135.4 August

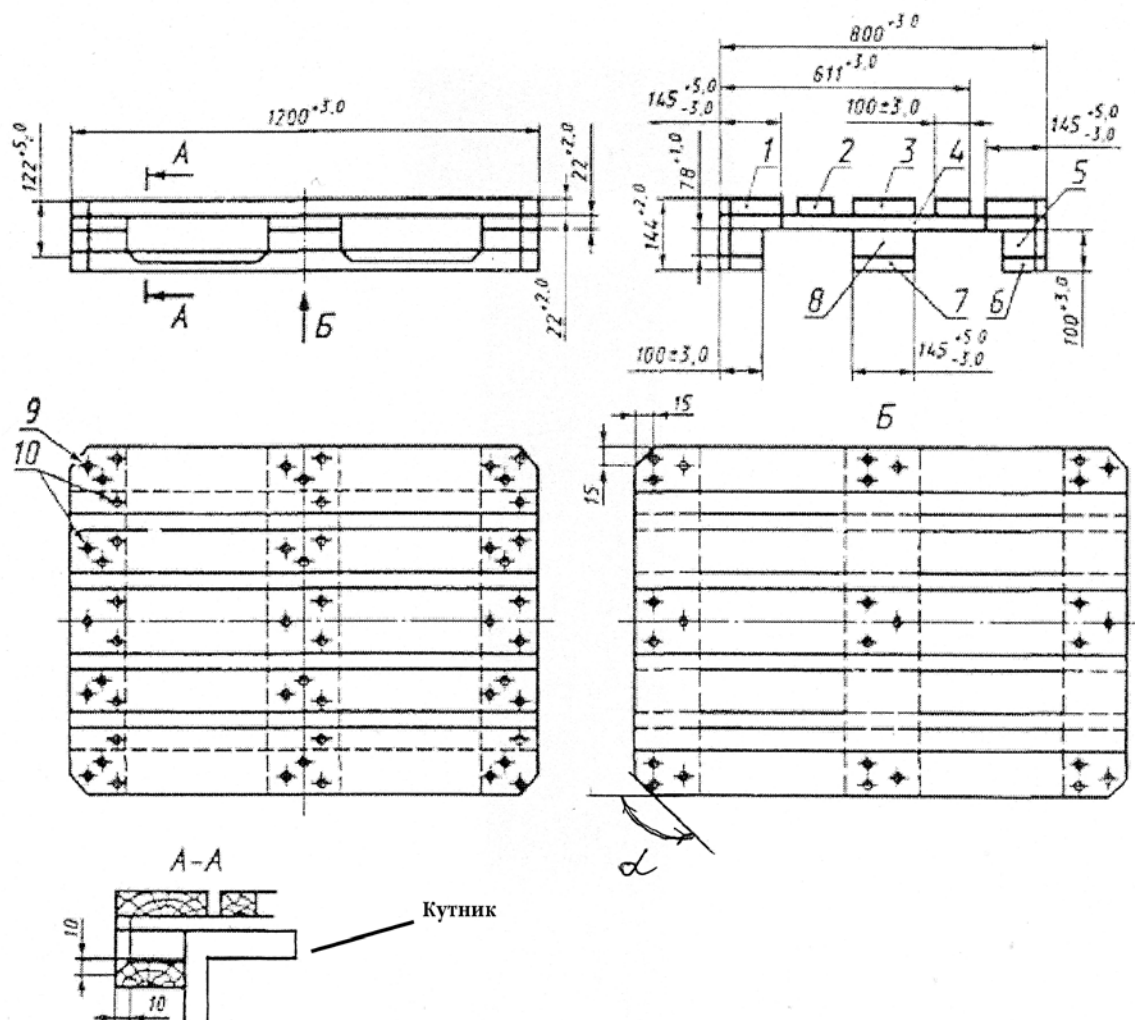


Fig. 2. Flat wooden pallet 1 - extreme board flooring; 2 - parquet flooring intermediate; 3 - parquet flooring average; 4 - Transverse board; 5 - had a sword; 6 - extreme board bases; 7 - board based on the average; 8 - a large sword; 9 - Screw nails.

The exact angle circumcision -  $135^{\circ} \pm 1^{\circ}$ . The measurement results are perpendicular milled Lisok lower pallet boards with respect to their longitudinal edges are shown in Table. 2.

Admission perpendicular - 0.3 mm for length measurement 100 mm. Studies have shown that precision handling pallets (the value gap between angles and lower longitudinal edge of the pallet boards during

milling Lisok) using new equipment compared to analogue higher by 27%.

## **2. The results of the measurements perpendicular to the longitudinal Lisok milled edges lower boards.**

Number (refer to sample)	The size of the gap between angles and lower longitudinal edge of the pallet boards during milling Lisok on line fashion. «MFRA-1000", mm	The size of the gap between angles and lower longitudinal edge of the pallet boards during milling Lisok created on line, mm
1	0.48	0.25
2	0.36	0.27
3	0.44	0.31
4	0.29	0.34
5	0.46	0.32
x = 0.406 in August		x = 0,298 in August

## **Conclusions**

1. Established automatic processing line for wooden pallets based on new technical solutions can improve the accuracy of circumcission angles pallets and milling Lisok lower pallet boards.

2. The results showed that the precision trimming corners pallets automatically created line is in the field of access through the use of a new system of regulation of the movement alert calipers.

3. The results showed also that performing a clip of some six actuators, each of which is equipped with clamping roller allowed to increase the precision milling Lisok, which is perpendicular to the longitudinal edges of the lower boards in the space of admission.

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*Of research wooden pallets accuracy of Monitor on a specially sozdannoy of automatic line.*

***Timber poddon, Linia Monitor pallets, accuracy, quality.***

*The research of accuracy of cutting the angles and milling the flat spots of bottom boards of wooden pallets on a newly designed processing line.*

***Wood, pallet, processing line, accuracy, quality.***

UDC 674.023.05

## INFLUENCE OF CUTTING PROCESS FOR STRUZHKOUTVORENNYA

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*The effect on the process of cutting angle struzhkoutvorennaya and cutting force.*

***Wood shavings, corner cutting, cutting force, struzhkoutvorennaya.***

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**Problem.** It is known [1,2,3] that the entry of the tool into the wood its front face, which is placed at an angle cutting  $\delta$  performs shift or lead generated with chips. The results of earlier studies show that the smaller the angle cutting  $\delta$  the less strain zrizuvanoho layer and its shrinkage and the less effort required for entry into the wood cutter. We also know that with decreasing cutting angle decreases resistivity cutting. Reduced cutting force using cutters with small angles of cutting forces arising from consideration (Figure 1), which act on the part of the front face of the tool on wood [4]