використовується для виготовлення деревинностружкових плит (ДСП). Розроблено практичні рекомендації щодо використання ВЖД у виробництві ДСП. Досліджено проблему, вирішення якої забезпечить утворення ресурсозберігаючих та екологічно безпечних технологій на основі використання ВЖД. Встановлено, що дана проблема може бути вирішена в кілька етапів: оцінка поточного стану проблеми; обґрунтування класифікації ВЖД та оцінки її потенціалу; розроблення методики для проведення експериментальних досліджень; моделювання технологічних процесів; аналіз результатів експериментальних досліджень; розроблення технологічних процесів і практичних рекомендацій щодо використання ВЖД; здійснення досліджень у виробничих умовах. Використано системний підхід і до утилізації ВЖД. Досліджено вплив вмісту ВЖД у кожному із шарів та в'яжучого на фізико-механічні властивості тришарових ДСП – міцність при статичному згині, розтягу перпендикулярно до площини плити та набрякання. Отримано адекватні математичні моделі залежності фізико-механічних властивостей ДСП від вмісту ВЖД в кожному шарі і в'яжучого. Було запропоновано створити дільницю для підготовки ВЖД. розроблено методику виробництва тришарових ДСП із ВЖД.

Ключові слова: вживана деревина, потенціал ВЖД, ДСП, стружка, властивості плит, математичні моделі, дерево оброблювальні технології, практичні рекомендації.

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Prof. V.O. Mayevskyy – UNFU;
assoc. prof. A.Ya. Vus – Ivan Franko National University of Lviv;
O.M. Mayevska – Institute of Cell Biology; prof. R.I. Matsyuk – UNFU

LOCATION OF SAWING PATTERN ON THE COVERING WORKING ZONE OF SEGMENT AND SECTOR WITH CONSIDERATION OF THEIR REAL SHAPE

The simulation method for variants of location of sawing pattern on the working zone covering by sawing pattern of segment and sector was considered. Consideration of real shape for log (segment) based on results of scanning for shape surface of log cross sections was provided for simulation process.

Keywords: log, segment, sector, covering working zone, location of sawing pattern, real shape, simulation, volume, log rotation.

Statement of problems and research currency. During the work [1] the topicality of research is proven and the simulation method for variants of location of sawing pattern on the working coverage zone of log is developed with the consideration of natural fluctuations of its real size characteristics, the usage of which will provide the lumber sawing of minimally acceptable and larger sizes. Given method is mathematically proven, experimentally confirmed and applicable to the determination of all possible variants of location of sawing pattern on the working coverage zone of log. It is also applicable to the determining of optimal variant which is characterized by the dimension of step displacement of working coverage zone and turn angle of log around the linear regressive axis. Instead, a similar problem on simulation of variants of location of sawing pattern on the working coverage zone of segments and sector with the consideration of natural fluctuations of its real size characteristics is almost undiscovered. Therefore, it is actual line of research, which requires scientific argumentation and solution.

The analysis of existing researches. It is important to mention that despite the detailed researches in the sawmill technology that were carried out in order to solve the problem of rational sawing of logs (cants, segments) on sawn timber by sawing process simulation, this issue is not fully solved [1-3]. Therefore, in the present paper the development of theoretical and practical approach to the process of log sawing is suggested, in particular the method of simulation of variants of location of sawing pattern on the working coverage zone of segment and sector with the consideration of its real size.

The features of simulation for variants of location of sawing pattern on the working zone covering of segment and sector with the consideration of its real size. The determining method of width of the working coverage zone of segment and sector with the consideration of its real size is provided in the paper [2].

The freedom of location of sawing pattern on the working coverage zone of segment and sector is defined as:

$$\lambda_{\max} = A + pr - \sum_{g=1}^{G}\left(t_g + d_{t_g} + pr\right), \tag{1}$$

where: A – width of working coverage zone of sawing pattern of segment and sector; pr – thickness of saw cut; t_g – thickness of gth lumber; d_{tg} – drying of gth lumber; g – an serial number of lumber on the sawing pattern (lumber must be renumber from left to right for the logical presentation of information); G – the amount of lumber in the sawing pattern.

The displacement step of sawing pattern on the working coverage zone is presented as:

$$\lambda_q = \frac{q\lambda_{\max}}{p}, \; q = \overline{0, p}, \tag{2}$$

where p – a number of variants of sawing pattern location on the working coverage zone (defined *a priori*).

On purpose to evaluation of sawing pattern of logs (segments, sectors) the comparison of lumber volume received by various variants of sawing pattern on the working coverage zone is provided. Determination of lumber volume, which along with volume recovery (yield) is one of the determinant criteria for evaluation of sawing pattern was conducted as for the lumber with the consideration of its type (unedged lumber, one-sided edged lumber, combined lumber, one-sided wedged and two-sided wedged lumber), as well for the process of sawing of edged lumber from unedged lumber, one-sided edged lumber, combined lumber, one-sided wedged and two-sided wedged lumber).

In the process of lumber size determining, sawed from a log (segment, sector), for each of meanings λ_q, that characterizes the variant of location of sawing pattern on the working coverage zone, it is necessary to make a calculations of the width of internal and external faces at each cross section $\left(i = \overline{0, N}\right)$ and acceptable lumber lengths. The thickness of lumber is taken from sawing pattern of segment and sector, received by the exhaustive method of all acceptable variants.

The simulation for variants of location of sawing pattern on the working coverage zone of segment. The width of sawn timber face on each cross section $\left(i = \overline{0, N}\right)$ of gth one-sided edged lumber $\left(g = \overline{1, G}\right)$ from the sawing pattern of segment (Fig.1) is defined as:

- Left $R_i(\varphi)\cos\varphi = -{}^{SEG}A^L + \lambda_q + \sum_{s=1}^{g-1}\left(t_s + d_{t_s} + pr\right), \; \varphi \in (0, \pi);$ (3)
- Right $R_i(\varphi)\cos\varphi = -{}^{SEG}A^L + \lambda_q + \sum_{s=1}^{g}\left(t_s + d_{t_s} + pr\right) - pr, \; \varphi \in (0, \pi).$ (4)

According to the solutions $\varphi_L^{(g)}$ of equation (3) and $\varphi_R^{(g)}$ (4) we will find the width of left (${}_L b_i^{(g)}$) and right (${}_R b_i^{(g)}$) faces of one-sided edged lumber on *ith* cross section:

$${}_L b_i^{(g)} = \chi\left(R_i\left(\varphi_L^{(g)}\right)\sin\left(\varphi_L^{(g)}\right) - \sigma\right); \tag{5}$$

$${}_R b_i^{(g)} = \chi\left(R_i\left(\varphi_R^{(g)}\right)\sin\left(\varphi_R^{(g)}\right) - \sigma\right), \tag{6}$$

where: χ is a characteristic function $\left(\chi(\beta)=\begin{cases}\beta, & \beta \ge b_{\min}\\ 0, & ELSE.\end{cases}\right)$; σ is the distance from linear regressive axis of log to the sawed part of segment.

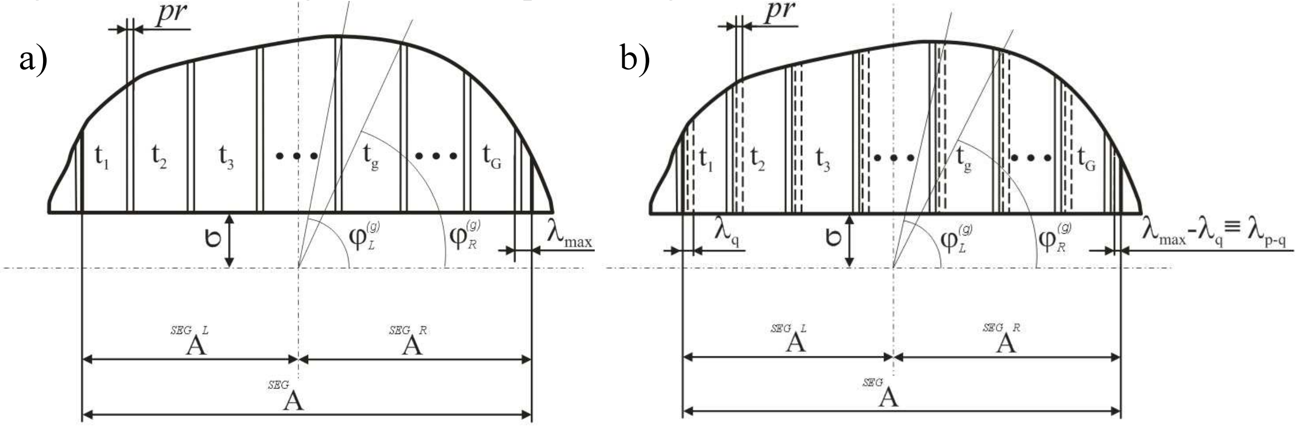

Fig.1. The location of sawing pattern on the working coverage zone of segment (i^{th} cross section): a) initial (leftmost) locating of sawing pattern; b) displacement of sawing pattern on a step λ_q

Note if there is at least one of the meanings ${}_Lb_i^{(g)}$ or ${}_Rb_i^{(g)}$ of the width of face on some cross section is less than $b_{\min}$, then it accepts as equal to zero.

Let us additionally set ${}_Lb_{-1}^{(g)}={}_Rb_{-1}^{(g)}={}_Lb_{N+1}^{(g)}={}_Rb_{N+1}^{(g)}=0$ (on both sides of the log ends) and ${}_Lb_i^{(g)}$, ${}_Rb_i^{(g)}$ simultaneously equal to zero, if at least one of the equations (3) or (4) does not have solution. Then, it is necessary to define acceptable length of fragment of gth lumber according to the fixed meanings ${}_Lb_i^{(g)}$ and ${}_Rb_i^{(g)}$.

The terms "left" and "right" sawn timber faces characterize gth lumber with the numeration of lumber location in the sawing pattern from the left to the right. It is necessary to mention that the identification of internal and external faces in the sawing pattern is realized depend on their location with regard to the linear regressive axis of log.

The conditions of acceptability of gth lumber fragment ($l_{fr} \ge l_{\min}$ and $b_{fr} \ge b_{\min}$ along the full length of fragment), if it is located between known edge cross of log $i_{1j}^{(g)}$ and $i_{2j}^{(g)}$ (j is an serial number of gth lumber fragment), can be written as follows:

$$\begin{cases} {}_{in}b_{i_{1j}-1}^{(g)}=0 \;\; OR \;\; {}_{ex}b_{i_{1j}-1}^{(g)}=0; \\ {}_{in}b_{i_{2j}+1}^{(g)}=0 \;\; OR \;\; {}_{ex}b_{i_{2j}+1}^{(g)}=0; \\ {}_{in}b_i^{(g)} \ge b_{\min},\; {}_{ex}b_i^{(g)} \ge b_{\min} \;\; \left(i_{1j} \le i \le i_{2j}\right) \; AND \; \left(i_{2j}-i_{1j}\right)h \ge l_{\min}, \end{cases} \tag{7}$$

where h is the step of scanning.

Simultaneous performance of mentioned below conditions is an indicator of the presence of acceptable gth lumber fragment:

$$\begin{cases} {}_{in}b_{i_{1j}-1}^{(g)} \cdot {}_{ex}b_{i_{1j}-1}^{(g)}=0; \\ {}_{in}b_{i_{1j}}^{(g)} \cdot {}_{ex}b_{i_{1j}}^{(g)}>0; \\ {}_{in}b_{i_{2j}}^{(g)} \cdot {}_{ex}b_{i_{2j}}^{(g)}>0; \\ {}_{in}b_{i_{2j}+1}^{(g)} \cdot {}_{ex}b_{i_{2j}+1}^{(g)}=0; \\ \left(i_{2j}-i_{1j}\right)h \ge l_{\min}. \end{cases} \tag{8}$$

The volume of identified acceptable gth lumber fragment is defined as:

- one-sided edged lumber $V_j^{(g)(o.s)} = \sum_{k=i_{1j}}^{i_{2j}-1} \frac{\left({}_{in}b_k^{(g)} + {}_{ex}b_k^{(g)}\right)/2 + \left({}_{in}b_{k+1}^{(g)} + {}_{ex}b_{k+1}^{(g)}\right)/2}{2} ht_g$; (9)
- edged lumber (with parallel edges) $V_j^{(g)(e)} = \left(i_{2j} - i_{1j}\right) \min_{k \in \left[i_{1j}, i_{2j}\right]} \left({}_{in}b_k^{(g)}, {}_{ex}b_k^{(g)}\right) ht_g$; (10)
- edged lumber (of maximal volume) $V_j^{(g)(e.\max)} = \max_{0 \le i \le n\text{-}m} \max_{i+m \le j \le n} (j-i) \min_{i \le k \le j} \left({}_{in}b_k^{(g)}, {}_{ex}b_k^{(g)}\right) ht_g$, (11)

where i, j are an serial number of running scan (see [1])

The solving method for sawing of edged sawn timber of maximal volume is provided in the paper [1].

The total volume of acceptable gth lumber fragments is defined as:

- one-sided edged lumber $V^{(g)(o.s)} = \sum_{i_{1j}=0}^{N-1} \sum_{i_{2j}=i_{1j}+1}^{N} \xi_{(*)} \cdot V_j^{(g)(o.s)}$, (12)
- where $\xi_{(*)}$ is a characteristic function of conditions (8) $\begin{cases} \xi_{(*)} = 1, & IF \ (*) - TRUE \\ \xi_{(*)} = 0, & IF \ (*) - FALSE \end{cases}$; (13)
- edged lumber (with parallel edges) $V^{(g)(e)} = \sum_{i_{1j}=0}^{N-1} \sum_{i_{2j}=i_{1j}+1}^{N} \xi_{(*)} \cdot V_j^{(g)(e)}$; (14)
- edged lumber (of maximum volume) $V^{(g)(e.\max)} = \sum_{i_{1j}=0}^{N-1} \sum_{i_{2j}=i_{1j}+1}^{N} \xi_{(*)} \cdot V_j^{(g)(e.\max)}$. (15)

The total volume of lumber sawed from the segment is defined as:

- one-sided edged lumber $V^{(o.s)} = \sum_{g=1}^{G} V^{(g)(o.s)}$; (16)
- edged lumber (with parallel edges) $V^{(e)} = \sum_{g=1}^{G} V^{(g)(e)}$; (17)
- edged lumber (of maximum volume) $V^{(e.\max)} = \sum_{g=1}^{G} V^{(g)(e.\max)}$. (18)

The simulation for location of sawing pattern on the working coverage zone of sector by sawing of radial sawn lumber. The width of face on each cross section $\left(i = \overline{0, N}\right)$ of gth one-sided edged lumber $\left(g = \overline{1, G}\right)$ from the sawing pattern of sector (Fig.2) is defined as:

- Left $R_i(\varphi)\cos\varphi = -{}^{S}A^{L} + \lambda_q + \sum_{s=1}^{g-1}\left(t_s + d_{t_s} + pr\right), \quad \varphi \in \left(\frac{\pi}{4} < \varphi < \frac{3\pi}{4}\right)$; (19)
- Right $R_i(\varphi)\cos\varphi = -{}^{S}A^{L} + \lambda_q + \sum_{s=1}^{g}\left(t_s + d_{t_s} + pr\right) - pr, \quad \varphi \in \left(\frac{\pi}{4} < \varphi < \frac{3\pi}{4}\right)$. (20)

According to the solutions $\varphi_L^{(g)}$ of the equation (19) and $\varphi_R^{(g)}$ of the equation (20) we will find the width of left (${}_{L}b_i^{(g)}$) and right (${}_{R}b_i^{(g)}$) faces of one-sided wedged lumber on i^{th} cross section:

$$ {}_{L}b_i^{(g)} = \chi\left(R_i\left(\varphi_L^{(g)}\right)\left(\sin\left(\varphi_L^{(g)}\right) - \cos\left(\varphi_L^{(g)}\right)\right) - \frac{pr}{\sqrt{2}} \right); \quad (21)$$

$$ {}_{R}b_i^{(g)} = \chi\left(R_i\left(\varphi_R^{(g)}\right)\left(\sin\left(\varphi_R^{(g)}\right) - \cos\left(\varphi_R^{(g)}\right)\right) - \frac{pr}{\sqrt{2}} \right). \quad (22)$$

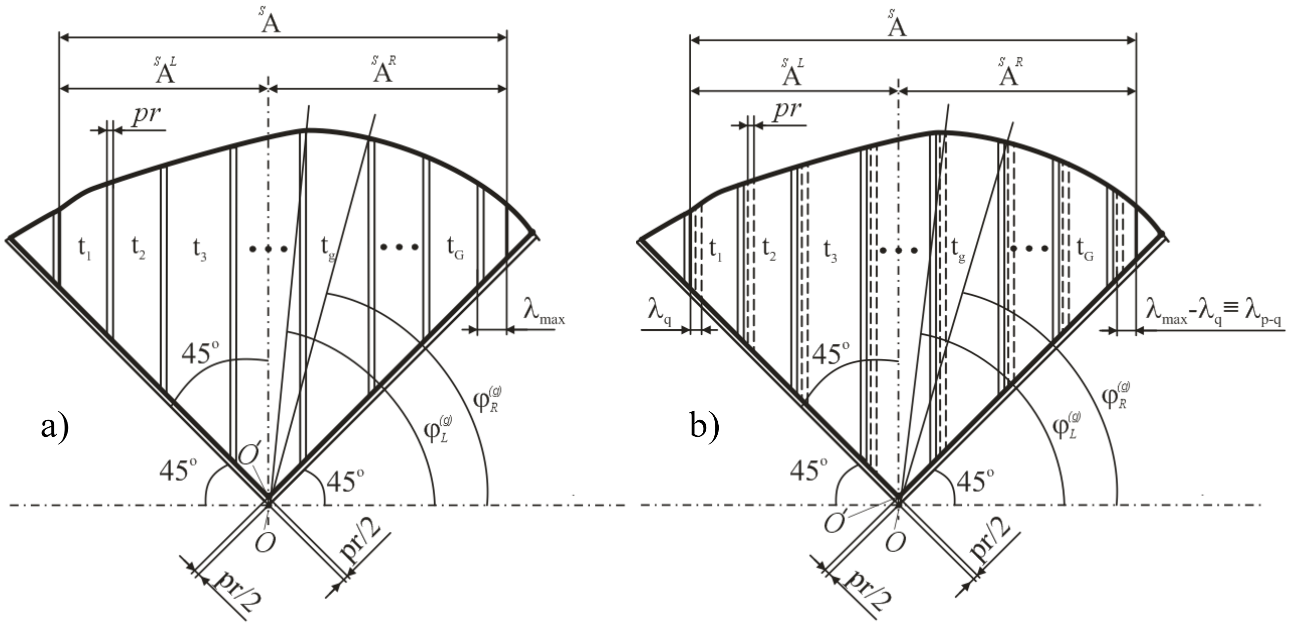

Fig. 2. The location of sawing pattern on the working coverage zone of sector by sawing of radial lumber (i^{th} cross section): *a) initial (leftmost) locating of sawing pattern; b) displacement of sawing pattern on a step λ_q*

There are additional conditions such as the condition of acceptability of gth lumber fragment (7) and existence indicator (8). Both are similar for one-sided wedged lumber and one-sided edged lumber. The volume of identified and acceptable g^{th} lumber fragment is defined as: one-sided wedged lumber (9), edged lumber (with parallel edges) (10), edged lumber (with maximum volume) (11).

The total volume of acceptable fragments of g^{th} lumber is defined as: one-sided wedged lumber (12), edged lumber (with parallel edges) (13), edged lumber (with maximum volume) (14). Then, the total volume of radial lumber sawed from the sector is defined as: one-sided wedged lumber (16), edged lumber (with parallel edges) (17), edged lumber (with maximum volume) (18).

The simulation of variants for location of sawing pattern on the working coverage zone of sector by sawing of tangential lumber. The width of face on each cross section $\left(i=\overline{0,N}\right)$ of g^{th} two-sided wedged lumber (unedged in curvilinear zone of sector) $\left(g=\overline{1,G}\right)$ from the sawing pattern of sector (Fig.3) is defined as:

- internal $R_i(\varphi)\cos\varphi = {}^{S}A^{L} + \lambda_q + \sum_{s=1}^{g-1}\left(t_s + d_{t_s} + pr\right),\ \ \varphi\in\left(-\frac{\pi}{4},\frac{\pi}{4}\right);$ (23)
- external $R_i(\varphi)\cos\varphi = {}^{S}A^{L} + \lambda_q + \sum_{s=1}^{g}\left(t_s + d_{t_s} + pr\right) - pr,\ \ \varphi\in\left(-\frac{\pi}{4},\frac{\pi}{4}\right).$ (24)

According to the solutions $\varphi_{1a}^{(g)},\ \varphi_{2a}^{(g)}\ \left(-\frac{\pi}{4}<\varphi_{1a}^{(g)}<0<\varphi_{2a}^{(g)}<\frac{\pi}{4}\right)$ of the equation (23) we will find the width of "upper" and "lower" part of internal sawn timber face of g^{th} lumber depending on the hit of cutting plane (saw cut plane) on edged plane or curvilinear zone of sector, in particular:

$$ {}^{up}_{in}b_i^{(g)} = \chi\left(\min\left(R_i\left(\varphi_{2a}^{(g)}\right)\cdot\left|\sin\left(\varphi_{2a}^{(g)}\right)\right|,\ d_a - \frac{pr}{\sqrt{2}}\right)\right); \tag{25} $$

$$ {}^{low}_{in}b_i^{(g)} = \chi\left(\min\left(R_i\left(\varphi_{1a}^{(g)}\right)\cdot\left|\sin\left(\varphi_{1a}^{(g)}\right)\right|,\ d_a - \frac{pr}{\sqrt{2}}\right)\right). \tag{26} $$

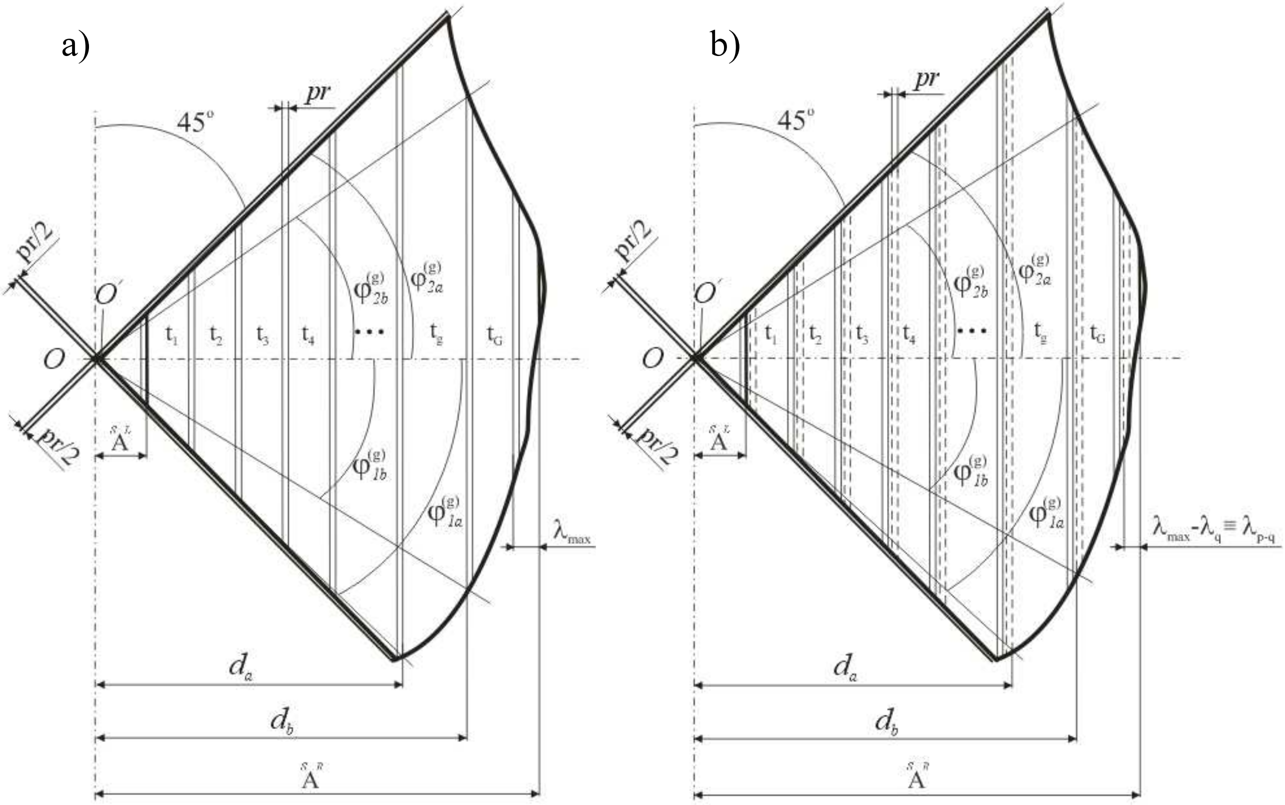

Fig. 3. The location of sawing pattern on the working coverage zone of sector by sawing of tangential lumber (ith cross section): *a) initial (leftmost) locating of sawing pattern; b) displacement of sawing pattern on a step* λ_q.

Similarly, according to the solutions $\varphi_{1b}^{(g)}$, $\varphi_{2b}^{(g)}$ $\left(-\frac{\pi}{4} < \varphi_{1b}^{(g)} < 0 < \varphi_{2b}^{(g)} < \frac{\pi}{4}\right)$ of the equation (24) we will find the width of "upper" and "lower" part of external face of gth lumber depending on the hit of cutting plane (saw cut plane) on edged plane or curvilinear zone of sector, including:

$$ {}^{up}_{ex}b_i^{(g)} = \chi\left(\min\left(R_i\left(\varphi_{2b}^{(g)}\right)\cdot\left|\sin\left(\varphi_{2b}^{(g)}\right)\right|,\ d_b - \frac{pr}{\sqrt{2}}\right)\right); \tag{27}$$

$$ {}^{low}_{ex}b_i^{(g)} = \chi\left(\min\left(R_i\left(\varphi_{1b}^{(g)}\right)\cdot\left|\sin\left(\varphi_{1b}^{(g)}\right)\right|,\ d_b - \frac{pr}{\sqrt{2}}\right)\right). \tag{28}$$

Then, according to the solutions (25) and (26) we will find the width of internal face. According to the solutions of the equation (27) and (28) we will find the width of external faces of side lumber on *ith* cross section:

$$ {}_{in}b_i^{(g)} = \chi\left({}^{up}_{in}b_i^{(g)} + {}^{low}_{in}b_i^{(g)}\right); \tag{29}$$

$$ {}_{ex}b_i^{(g)} = \chi\left({}^{up}_{ex}b_i^{(g)} + {}^{low}_{ex}b_i^{(g)}\right). \tag{30}$$

There are additional conditions such as the condition of fragment acceptability for gth lumber (7) and existence indicator (8). Both are similar for two-sided wedged lumber and one-sided edged lumber.

The volume of identified and acceptable fragment for gth lumber is defined as:

- two-sided wedgeg $V_j^{(g)} = V_{j1}^{(g)} + V_{j2}^{(g)}$; (31)

$$V_{j1}^{(g)} = \sum_{k=i_{1j}}^{i_{2j}-1} \frac{\left({}_{in}b_{1k}^{(g)} + {}_{ex}b_{1k}^{(g)}\right)/2 + \left({}_{in}b_{1k+1}^{(g)} + {}_{ex}b_{1k+1}^{(g)}\right)/2}{2} ht_g \, ;$$

$$V_{j2}^{(g)} = \sum_{k=i_{1j}}^{i_{2j}-1} \frac{\left({}_{in}b_{2k}^{(g)} + {}_{ex}b_{2k}^{(g)}\right)/2 + \left({}_{in}b_{2k+1}^{(g)} + {}_{ex}b_{2k+1}^{(g)}\right)/2}{2} ht_g \, ,$$

where: ${}_{in}b_{1k}^{(g)}$, ${}_{ex}b_{1k}^{(g)}$ are the width of internal and external sawn timber faces of lower part of gth two-sided wedged lumber respectively; ${}_{in}b_{2k}^{(g)}$, ${}_{ex}b_{2k}^{(g)}$ are the width of internal and external sawn timber faces of upper part of gth two-sided wedged lumber respectively;

- edged lumber (with parallel edges)

$$V_j^{(g)(e)} = V_{j1}^{(g)(e)} + V_{j2}^{(g)(e)} \, ; \tag{32}$$

$$V_{j1}^{(g)(e)} = \sum_{k=i_{1j}}^{i_{2j}-1} \min\left({}_{in}b_{1k}^{(g)}, {}_{ex}b_{1k}^{(g)}\right) ht_g \, ;$$

$$V_{j2}^{(g)(e)} = \sum_{k=i_{1j}}^{i_{2j}-1} \min\left({}_{in}b_{2k}^{(g)}, {}_{ex}b_{2k}^{(g)}\right) ht_g \, .$$

- edged lumber (of maximum volume)

$$V_j^{(g)(e.\max)} = \max_{0 \le i \le n\text{-}m} \, \max_{i+m \le j \le n} (j-i)\chi\left(\min_{i \le k \le j}\left({}_{ex}b_{1k}^{(g)}, {}_{in}b_{1k}^{(g)}\right) + \min_{i \le k \le j}\left({}_{ex}b_{2k}^{(g)}, {}_{in}b_{2k}^{(g)}\right)\right) ht_g \, . \tag{33}$$

The total volume of acceptable fragments of gth lumber is defined as: two-sided wedged lumber (12), edged lumber (with parallel edges) (13), edged lumber (with maximum volume) (14). Then, the total volume of tangential lumber sawed from the sector is defined as: two-sided wedged lumber, edged lumber (with parallel edges) (17), edged lumber (with maximum volume) (18). It is necessary to mention, that during the process of quarter (sector) sawing method into tangential lumber from curvilinear sector zone, except two-sided wedged lumber we could also get unedged and conventionally unedged (combined) lumber [4], the calculation method of which is analogues to the calculation method of unedged lumber taken from the simulation process for variants of location of sawing pattern on the working coverage zone of log [1].

The features of simulation for variants of location of sawing pattern on the working coverage zone of segment and sector by their rotation around the log axis at defined angle. It is known [2] that the width of working coverage zone of sawing pattern of log (cant, segment and sector) depends on different variants of log rotation around its axis at defined angle. Consequently, the calculation of location of sawing pattern on this zone for each rotation angle of log gives us the possibility to find the variants which will provide the optimal recovery (yield) of lumber.

In a case of usage of sawing methods which provide sawing of segments and sectors that are further sawn up into lumber, the lumber volume for each rotation angle and for each its part (cant, segment and sector) should be calculated. For example, the optimal recovery (yield) of lumber from a log for the quarter (sector) sawing method is defined as: $V_{\max} = \max_{\varphi}\left(\max_{S_1}\left(\max_{q_1} V_1 \right) + \max_{S_2}\left(\max_{q_2} V_2 \right) + \max_{S_3}\left(\max_{q_3} V_3 \right) + \max_{S_4}\left(\max_{q_4} V_4 \right) \right)$, (34)

where: φ the rotation angle of log around its axis; V_1, V_2, V_3, V_4 the volumes of lumbers from 1st, 2nd, 3rd or 4th sectors; S_1, S_2, S_3, S_4 sawing patterns that are used for the sawing of related sectors; q_1, q_2, q_3, q_4 the quantity of displacement steps for sawing patterns on the coverage zones of related sectors.

In case of technological need to use one of the sawing patterns for all sectors, the formula (34) can be written as follows:

$$V_{\max} = \max_{\varphi}\left(\max_{S}\left(\max_{q_1} V_1 + \max_{q_2} V_2 + \max_{q_3} V_3 + \max_{q_4} V_4\right)\right). \qquad (35)$$

Conclusions:

1. The simulation method for variants of location of sawing pattern on the working coverage zone of segment and sector with the consideration of natural fluctuations of its real size characteristics is developed. The usage of it will provide the lumber sawing of minimally acceptable and larger sizes. Given method is mathematically proven, experimentally confirmed and applicable to the determination of all possible variants of location of sawing pattern on the working coverage zone of segment and sector.
2. The approach towards the simulation for variants of location of sawing pattern on the working coverage zone of segment and sector applicable for main industrial processes of log sawing into lumber.
3. The comparison of lumber volumes, sawed from log, segment(s) and sector(s), by various variants of location of sawing pattern on the working coverage zone depending on log rotation around its axis at defined angle, gives the possibility to determine an optimal variant, which is characterized by the displacement step of sawing pattern on the working coverage zone and angle of log rotation around the linear regressive axis.

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Проф. В.О. Маєвський, д-р техн. наук, проф. Р.І. Мацюк – НЛТУ України; доц. А.Я. Вус – Львівський НУ ім. І. Франка; мол. наук. співр. О.М. Маєвська – Інститут біології клітини

Розміщення схеми розпилювання на робочій зоні охоплення сегмента та сектора з урахуванням їх реальної форми

Наведено методику моделювання варіантів розміщення схеми розпилювання на робочій зоні охоплення сегмента та сектора. У процесі моделювання передбачено урахування реальної форми колоди (сегмента, сектора), отриманої за результатами сканування форми поверхонь поперечних перетинів. З метою оцінювання схем розпилювання колод (сегментів, секторів) передбачено порівняння об’єму пиломатеріалів, отриманого за різними варіантами розміщення схем розпилювання на робочій зоні охоплення сегмента (сектора) та залежно від обертання колоди навколо лінійної регресійної осі на заданий кут.

Ключові слова: колода, сегмент, сектор, робоча зона охоплення, розміщення схеми розпилювання, реальна форма, моделювання, об’єм, обертання колоди.