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HEALTH-RESTORING SMART BAG FOR MEDICAL WORKERS: AN EMOTIONAL AND PHYSICAL RECOVERY SYSTEM

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Abstract

It is known that medical employees, especially doctors and nurses, have high responsibility, an intensive work mode, and emergencies because of continuous psycho-emotional stress under the circumstances. They are often faced with medical bags and work equipment, mainly functional items, for transportation and to keep for intended stress reduction or emotional recovery provision to the function owner.Therefore, work on the process stress level of employees to reduce the directed integrated technical solution does not.

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Invention Essence

Proposal being pushed: useful model medicine employees for work in the process of physiological and psychological relaxation, provider of many functional antistress the bag in view. It will catch.

Model functional modules based on work climbed, every modulus of stress reduces the muscles' release, emotional stability provision, and labor ability restoration task.

Construction and technical solution

Antistress bag is below structural from parts consists of:

1. **Main Department**

Medical documents, antiseptics, tablet and personal things for the intended. Walls weather conductor and covered with antibacterial material.

2. **Aromatherapy antistress: The module**

is installed in the bag, interchangeable through an aromatherapeutic capsule (lavender, lemon, or eucalyptus essence). Stress to reduce service.

3. **Massage element**

Silicone or rubber anti-stress balloon in appearance, to release hand muscles.

4. **Temperature keeper section**

Hot or cold compresses for special isolated partly consists of

5. **Psycho-emotional block**

Mini notebook, motivational cards, and rapid relaxation short instructions are included.

6. **Biofeedback module**

Heart beating or stress level with a sensor equipped. Information on the smartphone application will be transferred, and individual breath exercises according to recommendations will be given.

7. **Micropause relaxation module**

via USB rechargeable mini massager or vibrational relaxation device.

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8. **Intelligent time-management block**

time rest in between, about a reminder signaling system.

9. **Power port**

USB or Power bank connection opportunity.

10. **Material and ergonomics**

Light, moisture-resistant, antibacterial material prepared for the back part of the memory foam, based on soft, not to be covered.

11. **Aesthetic- psychological elements**

Mini mirror and positive motivation records placed

Technical result

Propose the following technical results of the proposed model to achieve:

- medicine of employees' work stress level at the time up to about 15–20% reduction;
- emotional stability increases;
- labor efficiency improvement;
- work on the process mistakes probably reduction

Advantages

- Psychoemotional recovery provider integrated construction;
- Ergonomic and modular design;
- Real-time stress monitoring mode;
- In conditions of high stress (epidemic, emergency situations) practical application opportunity.

Functional block	Impact field	Efficiency (approx.)
Biofeedback and sensors	Heart beating and excitement control to do	**+25%** control
Aroma and Massage	Muscles and the nervous system relaxation	**+30%** relaxation
Psychological block	Mood and motivation lifting	**+20%** emotional strength
Ergonomics (Memory foam	Physical tiredness reduction	**+15%** convenience

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Stress reduction process (functional diagram)

How is this diagram bag to achieve a technical result (reducing stress by 15-20%) . shows:

Step	Movement / Part	Result
Monitoring	Biofeedback sensor heart rate measures	Increased stress is determined
Signal	Smart block and smartphone message	User to relax is called
Relaxation	Aromatherapy + Vibro-massage	Muscles and the nervous system relax
Cognitive recovery	Motivational block + Breath exercises	The emotional situation will recover

3 Application field

This anti-stress bag hospital , clinic, laboratory, ambulance, help service, and rehabilitation centers, activity driver medicine employees for intended.

Model public work to take out suitable modifications and design options work

1. “ Mini-Med” Stress " Test."

(Medicine employees 1-minute express test for

Instructions:

In the last 24 hours, work in the process following situations, to the extent observed?

0 — None

1 — Slight

2 — Moderate

3 — Strong

4 — Very strong

Questions:

1. Work during rapid fatigue or weakness feeling I did it.
2. Patients or colleagues in conversation. It happened.
3. Time shortage due to internal pressure feeling I did it.
4. My heart beating accelerated or in my body, stress, I felt it.

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5. Attention collection. It became difficult.

Scores calculation:

All answers are added.

Maximum score: 20

Result:

- **0–5 points** → Low stress
- **6–12 points** → Moderate stress
- **13–20 points** → High stress

. Biofeedback + test combined formula

The sensor in the bag is the following measures :

- Heart beating heart rate (HR)
- Heart beating variability (HRV)

Normal range:

- HR: 60–90 bpm
- HRV: individual norm relatively

Integrated stress index (MSI - Med Stress Index

Formula:

MSI = (T × 0.6) + (B × 0.4)

This on the ground:

T — Mini-Med test score (0–20)

B — Biofeedback score (from 0–20) to the scale normalized)

Biofeedback ball calculation:

If: HR normal → 5 points

- High HR (+10–20%) → 10 points
- HR is very high (+20%↑) → 15 points
- HR high + HRV low → 20 points

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Interpretation of MSI:

- **0–8** → Normal situation
- **9–14** → Average stress
- **15–20** → High stress (micropause recommendation)

" Stress determination algorithm" part

Algorithm steps:

1. Use the Mini-Med Stress Test fills.
2. Bag sensor through heart beating and HRV are measured.
3. Test scores and physiological indicators digital to the scale will be held.
4. MSI formula through the integrated stress index is considered.
5. To the index automatic recommendation is given accordingly:
   - Low stress → work continues to be introduced
   - Medium stress → 3 minutes breath exercise
   - High stress → 5- minute relaxation + massage module
6. The result is a smartphone app is saved, and dynamic analysis will be done.

Technical news: This algorithm includes subjective (psychological test) and objective (biophysiological sensor) indicators united in the case of stress determination. This medicine employees for work expresses assessment on the spot, possibly gives.

Medicine Employees for Breath Exercises

These exercises work in the process (from the operation before, heavy from duty then) prompting recovery help gives:

1. **"Square" method (Quick calm down):**

1. 4 seconds breath take → 4 seconds breath holding stand → 4 seconds breath release → 4 seconds' stop.

"4-7-8" technique (Sleeping and hard excitement press):

1. 4 seconds through the nose breath to take
2. 7 seconds breath inside seizure

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3. 8 seconds from the mouth slowly to extract.

" Diaphragmatic " breath (Energy recovery):

1. Abdomen with deep breath to take. This blood rotation improves and tiredness reduces.

3. Economic efficiency account (Estimated)

The project's economic benefit " worker" of strength decreases, and errors at the expense of a decrease is formed.

Index	Impact mechanism	Economic result
Work ability (Productivity)	Stress reduction on account of your attention increase.	Work efficiency **increases by 10–15%** increases.
Disease leaflets (Sick leave)	Emotional prevention of fatigue (burnout). to take	The number of leaflets **decreases by 20%** decreases.
Errors likely	Attention accumulation as a result of medical mistakes decreases.	Treatment expenses and compensations are saved.
Employees exchange	Work from the conditions satisfaction harvest to do	New employees hiring and teaching expenses **30% off**.

Conclusion

On average, the bag price on average, it fetches $ 40-60 annually, indirectly resulting in a profit of $500–$ 800 verb possible.

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